EDINBURGH MEDICAL JOURNAL

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EDITORIAL NOTES.

National Insurance Act. THE Representative Meeting of the British Medical Association has cleared the air. Certain things may now be predicted with certainty, others with a high degree of probability. It is certain, whatever else may come to pass, that the contributors generally will not obtain that thoroughly efficient medical service which they ought to have had under the Insurance Act : and it is certain that present-day club practice, semi-charitable in its inception, and overladen with abuses in its later phases, will on the 15th of January be a thing of the past. Of the future action of the minority of the Association and of the non-voters it is impossible to speak with such certainty. The probability is that among the latter the proportion against serving under the Act is at least as great as among the voters, and so long as the Association exists as the mouthpiece of the profession it is hardly conceivable that deliberate pledges will be violated wholesale. Nor is it too much to expect that the minority will abide loyally by the policy of the Association, which issues from the considered verdict of five-sixths of the voters and nine-tenths of their representatives.

With the 15th of this month all existing contracts cease, and there will be but few agreements under the Act to take their place. There is, of course, no question of a "strike." Such a thing has never been dreamt of outside the offices of the anti-medical press. No sick or injured person will lack treatment because the Insurance Commissioners are powerless to make terms. Doctors will go on attending the sick as they have been accustomed to do, with more thought of the patient's necessities than of his ability to pay his bills. It would take more than the muddling of a Government to reverse the whole tradition of a learned and humane profession.

Obviously, however, the threatened confusion must be minimised. There is no need to consider areas in which adequate panels can be formed. Over the greater part of the country, however, medical benefits will not be effectively in force. Here, then, is a field for a constructive programme such as was foreshadowed at the Representative Meeting. It is the declared policy of the Association that the profession in different areas shall deal directly with insured persons or their representatives without reference to Insurance Committees. Arrangements come to in this way are free from the objections which exist against local bargaining with Insurance Committees; they are mere

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temporary expedients to prevent chaos. The situation is developing on the same lines as in Germany, with the advantage that the profession here has a national organisation and is not broken up into groups. To facilitate a *modus vivendi* the Association has laid down easy terms —free choice of doctor, an inclusive capitation fee of 8s. 6d. or a minimum visiting fee of 2s. 6d., and general responsibility in the hands of the medical profession. The conditions are broad enough to allow for local differences, yet sufficiently stringent to ensure general uniformity.

To induce the medical profession to accept service under the Act three threats have been employed. So far from being frightened, the Association is prepared to face the friendly societies, and in allowing the medical benefit to be suspended, boldly asks that two of these threats be made good. Of the third threat—a public medical service—there is yet something to be said. It is inconceivable that Mr. Lloyd George can have realised the significance of his promise that doctors who go on the panels will certainly be given priority of consideration for whole-time appointments if they desire to compete for them. To attach such condition to entry into a public service is to introduce the principle of selection under the cloak of competition— a principle which conduces to nepotism rather than to equity, which is in process of being eliminated from the Civil Service, and which few desire to see restored. If the Chancellor of the Exchequer's words were seriously intended they call for serious reprobation; if they were an inadvertence they should be corrected; if they were merely intended as a bribe they will fail of their object.

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Operations under Compulsion.

In a letter to the editor of the *Spectator* Lord Hugh Cecil draws attention to a case which appears to us to raise some questions of medical interest. The facts as cited by Lord Hugh are shortly these. The attention of the National Society for the Prevention of Cruelty to Children was drawn to the case of a little girl about eight years old who suffered from cleft palate "so severe as to make her almost unintelligible in speech except to those who were very familiar with her." After obtaining "the best medical advice," which "was to the effect that the child ought to be submitted to a surgical operation which was simple and without danger and would restore the child to clear speech," the Society urged upon the father, who appears to be a respectable although poor man, the necessity for accepting this advice. The father refused his consent to the operation, whereupon the Society took proceedings against him under the Children Act, 1908. Under section 12 of the Act the magistrates found that the father had failed to provide medical aid for his child, and imposed a fine of one shilling. "A conviction having thus been recorded against him, it was possible under section 21 to take away from him the custody of his child and

to give it to the Society, and the magistrates made an order to that effect. When the child was taken to the hospital, however, further proceedings were threatened on the father's behalf, and the custody of the child was abandoned by the Society, who returned her to her father."

We do not propose to discuss the important questions raised by this case with regard to parental responsibility and the supersession of parents by societies, magistrates, and courts. On these matters we would refer our readers to Lord Hugh Cecil's able argument,* which appears to us entirely convincing, and which has the support of the *Spectator*, as expressed in an editorial comment. Nor would we willingly say one word which might prejudice the N.S.P.C.C. Medical men have better opportunities than most others of appraising the excellent work done by this Society, and have often to rely on their co-operation in dealing with cases in which children are being inhumanly treated. We are satisfied that in the case under consideration their motives were of the highest, and that if wrong was done it was merely the result of an error of judgment. Cruelty is notoriously difficult to define, and much depends on collateral circumstances whether a given action is to be designated by this hard name. In a sense it may be cruel to allow an otherwise pretty girl to grow up with a squint uncorrected, or to neglect to give a lad who has to make his way in life the benefit of surgical treatment for a club-foot or a stiff elbow. We do not imagine, however, that it is to prevent this degree or form of cruelty that the Society exists. There is, unfortunately, ample scope for its energies in dealing with the grosser forms of inhumanity to children, and in its noble efforts in this direction it deserves, and we believe will ever receive, the support of the public.

There are other points raised by this case which more directly concern the medical profession. We have no means of knowing, of course, whether the surgeon who was consulted lent the weight of his opinion in favour of the Society before the Court, but it does not seem probable that a magistrate would take the extreme step of convicting a parent of negligence to provide medical treatment, and consequentially of depriving him of the custody of his child, on the mere *ipse dixit* of a lay society. That the case under consideration was a suitable one for operative treatment we do not for a moment question. Our only doubt is whether a surgeon is justified under the circumstances postulated in urging his opinion to the extent of inducing a magistrate to convict an honest parent of neglect for refusing to accept and act upon it.

We are not convinced that the operation is so simple, so free from danger, and so certain to restore the child to clearness of speech that the desires of even an obstinate parent should be overridden. Even

° *Spectator*, 14th December 1912, p. 1011.

in the most skilled hands, we submit, the operation for a marked degree of cleft palate (and in the present case the deformity seems to have been extreme) is not a simple one. Nor is it, or indeed any other operation, entirely free of danger, and, still more important, the immediate functional results as regards speech are by no means certain. Only by constant supervision and prolonged and arduous training can a child operated on at the age of eight be taught to speak with clearness.

On whom would the responsibility fall if by ill chance an anæsthetic fatality attended the operation, or if when the child was discharged from hospital, and presumably passed again under the care of her parents, she did not speak with clearness? Would the society who instigated the operation, the magistrate who sanctioned it, or the surgeon who performed it bear the brunt of the parents' righteous indignation?

We shall not attempt to argue the point on legal grounds, but we can well imagine that it was a consideration of such questions that prevented this unfortunate child from going further than the hospital door.

Royal Infirmary Managers.

THE Royal College of Physicians have elected Dr. T. R. Ronaldson and Dr. James Ritchie, Superintendent of the Laboratory of the College, to represent them on the Royal Infirmary Board. The Royal College of Surgeons have re-elected Dr. Charles W. MacGillivray, and have elected Mr. J. M. Cotterill.

Graduation Ceremonial.

AT the Graduation Ceremonial held on 18th December 1912 the following degrees in Medicine were conferred:—

DOCTOR OF MEDICINE.

*Babington, James William Herbert (Capt., I.M.S.), Ireland, M.B., Ch.B., 1904. The Etiology of Trachoma. Bidie, George (Major, I.M.S.), Scotland, M.B., C.M., 1908. Notes on Duodenal Ulcer (Its Symptomatology and Diagnosis). *Burgess, William Leslie, Scotland, M.B., Ch.B. (with First-Class Honours), 1909. The Effect of Tuberculin on the Blood; Its Value in the Diagnosis, Prognosis, and Treatment of Pulmonary Tuberculosis. Iles, Charles Cochrane, New Zealand, M.B., Ch.B., 1910. Arthritis Deformans (Atrophic Form); with Special Reference to the Bacterial Content of the Urine and the Vaccine Therapy of the Disease. *Leckie, Arthur James Bruce, India, M.B., Ch.B., 1908. Tuberculin Diagnostic Reactions; 654 Cases Comprising the Conjunctival, Cutaneous, and Percutaneous Tests. *Morrison, Robert Victor (Lieut., I.M.S.), Ireland, M.B., Ch.B., 1911. Trypanosomiasis. (*In absentiâ.*) Murray, William Paterson, Scotland, M.B., Ch.B., 1910. Observations in Leucocytosis in Normal Children, and also in Whooping-Cough and Lobar Pneumonia in Children. †Rutherford, Alexander Hamilton, Australia, M.B., C.M., 1898. The Ileocæcal Valve. (*In absentiâ.*) Scott, Jessie Anne, New Zealand, M.B., Ch.B., 1909. A Study of Pigmentation in Relation to Disease in Children. Walker, Edward Archibald, Scotland, M.B., Ch.B., 1908. Primary Pneumococcus Peritonitis.

* Commended for thesis.　　　　　† Highly commended for thesis.

BACHELOR OF MEDICINE AND MASTER IN SURGERY.

Walter Smithies, England.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

H. F. W. Adams, Scotland ; A. F. Adamson, Scotland ; J. W. E. Adkins, South Africa ; J. A. Andrews, England ; M. M. L. Atal, India ; C. M. Austin, Barbados ; Peter Baillie, Scotland ; E. B. Barton, England ; S. K. Basu, India ; J. P. Blockley, England ; D. L. Brown, Scotland ; G. M. Brown, Scotland ; A. F. Calwell, England ; John Cattanach, M.A., Scotland ; Hn Ts'en Chiang, China ; A. L. Christie, New Zealand ; F. M. Chrystal, Scotland ; A. Cohen, Scotland ; A. F. Cowan, Scotland ; F. E. Crew, England ; Lucy D. Cripps, England ; A. M°C. Davidson, Scotland ; A. E. Delgado, Jamaica ; P. K. Dey, India ; J. M. Donnan, Scotland ; Helen C. Dykes, Scotland ; Harry Evans, Wales ; D. O. Fairweather, Scotland ; A. G. Forbes, South Africa ; J. D. Forester, Scotland ; W. R. Gardner, Scotland ; J. G. Gill, Scotland ; Hans Gilliland, Ireland ; W. L. Glegg, Scotland ; James Gossip, Scotland ; A. L. Grant, Scotland ; J. W. C. Gunn, M.A., Orkney ; W. J. G. Henderson, Ireland ; Julie E. Hoffmann, Denmark ; Gwendolyn G. Hunter, Scotland ; I. W. Jones, Wales ; B. B. Kapila, India ; K. L. Kapur, India ; H. W. Kerrigan, Ireland ; V. M. Limbah, India ; W. E. Lewis, British Guiana ; G. J. I. Linklater, England ; J. S. Lloyd, England ; M. R. L. Macaulay, West Africa ; F. W. Mackenzie, Scotland ; F. D. S. M°Menamin, Ireland ; Hamed Mahmud, Egypt ; Israel Maisels, South Africa ; James Maxwell, Scotland ; A. J. A. Menzies, M.A., Scotland ; J. S. Monro, New Zealand ; J. G. O. Moses, India ; William Murray, Scotland ; °G. F. B. Page, England ; H. G. Parker, England ; C. R. Patton, India ; F. G. Power, Australia ; Aubrey Radford, South Africa ; Abdur Rahman, India ; Mary D. Rankine, Scotland ; A. C. Renton, England ; J. N. M. Ross, Scotland ; And. Rutherford, Scotland ; K. R. G. Shaw, India ; R. K. Shaw, England ; J. T. Smeall, Scotland ; H. W. Smith, England ; Robert Thomson, Scotland ; Ruby Thomson, Hong Kong ; +A. T. Todd, England ; A. H. Towers, South America ; R. W. W. Walsh, Australia ; Arthur Wright, Scotland ; Moung Ba Yin, India.

° With Second-Class Honours.   + With First-Class Honours.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

Norman Hay Bolton, M.B., Ch.B.

The Stark Scholarship in Clinical Medicine was awarded to William Douglas Denton Small, M.B., Ch.B.

Royal College of Surgeons of Edinburgh.

ARTHUR ROBINSON, M.D., Professor of Anatomy, has been elected a Fellow of the College.

The following gentlemen, having passed the requisite examinations, have been admitted Fellows of the College :—

William Anderson, M.B., Ch.B.(Aberd.), Aberdeen ; Frederick Adolphus Fleming Barnardo, M.B., Ch.B.(Edin.), Captain, Indian Medical Service ; Walter Waddell Carlow, M.B., Ch.B.(Edin.), Edinburgh ; Robert M°Lean Gibson, M.D.(Edin.), Hong-Kong ; William Clayton Grosvenor, M.D.(Edin.), Arnside, Westmoreland ; Henry Fleming Hamilton, M.B., Ch.B.(Edin.), West African Medical Service ; John William Hitchcock, L.R.C.S.E. (Triple Qual.), Suffolk ; John Albert Lee, M.B., C.M.(Edin.), Epsom, Surrey ; James Herbert Graham Robertson, M.B., Ch.B.(N. Zeal.), Captain, Army Medical Corps, New Zealand ; Stanley Robson, M.D., C.M.(Durh.), Gateshead-on-Tyne ; Percy Alexander Ross, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Parkstone, Dorset ; David Henry Russell, M.B., Ch.B.(Edin.), Dunfermline ; Norman Craig Shierlaw, L.R.C.S.E. (Triple Qual.), Adelaide ; John Edward Llewelln Simcox, M.B., Ch.B.(N. Zeal.), Dunedin ; William Percy Walker, M.R.C.S. (Eng.), L.R.C.P.(Lond.), D.P.H., Canada.

DIRECT LARYNGOSCOPY, TRACHEO-BRONCHOSCOPY, AND ŒSOPHAGOSCOPY.

An Account of the Direct Method of Examining the Larynx, Trachea, Bronchi, and Œsophagus; with some Illustrative Cases.

By A. LOGAN TURNER, M.D., F.R.S.E., F.R.C.S., Surgeon, and J. S. FRASER, M.B., F.R.C.S., Assistant-Surgeon, Ear and Throat Department, Royal Infirmary, Edinburgh.

I.

Although the direct method of examining and treating the larynx, trachea, bronchi, and œsophagus has been in common use for eight or ten years, no account of this improvement in our technic has yet appeared in this *Journal*. By this method we are able to bring the interior of the air-passages directly under the eye of the examiner, and not as a reflected image in a laryngoscopic mirror.

Up to the time of Kirstein's epoch-making development (1894) we were only able to examine the larynx by the indirect method introduced by Garcia. Tracheo-bronchoscopy was first carried out by Voltolini in 1875, but did not become of practical importance until 1895, when it was reintroduced by Kirstein. Killian in 1897 removed a foreign body from a bronchus by the direct method. In 1868 Kussmaul performed the first direct œsophagoscopy. He used an elongated urethroscope, and diagnosed a case of cancer of the thoracic œsophagus. Mikulicz and Leiter in 1881 designed an œsophagoscope, and in 1896 the former reported successful cases of tracheoscopy.

In the following account of the direct methods of examination the writers have no intention of claiming any originality, and cordially acknowledge their indebtedness to the work of Killian, von Eicken and Brünings (Germany), Kahler (Austria), Jackson, Ingals and Mosher (America), Guisez (France), Hill and Paterson (England and Wales), and Brown Kelly (Scotland).

The instruments used in the direct examination of the upper air and food passages, along with the illumination apparatus, are shown on Plate I.

DIRECT LARYNGOSCOPY.

Indications.—(1) Patients (usually children) who cannot be examined with the aid of the reflecting mirror. (2) Foreign bodies in the larynx. (3) Cases in which the indirect method affords an insufficient view on account of pathological swellings

or tumours. In such a case a piece may be removed for microscopic examination. (4) The direct treatment of the larynx, especially in cases of tuberculosis requiring galvano-caustic puncture; removal of polypi growing from the lower edge of the vocal cords; incision in cases of septic œdema or abscess; dilatation of strictures of the larynx and removal of papillomata, especially in children. (5) Laryngeal operations in which a general anaesthetic is necessary. (6) Injection of paraffin in cases of paralysis of one vocal cord. (7) Demonstration of laryngeal conditions to students.

Contra-Indications.—(1) Serious dyspnœa, especially if great mental anxiety be present. In such cases immediate tracheotomy should be performed. (2) Advanced aneurysm of the aorta, heart lesions, and arterio-sclerosis, in which it is important to avoid an increase in the blood-pressure. (3) Cases of hæmoptysis and extreme weakness.

Direct laryngoscopy is comparatively easy in women, children, and old people, who have, as a rule, long, slender necks. Strong men, on the other hand, with short, thick necks and tongues, are difficult subjects. If the upper incisor teeth are well developed and prominent, autoscopy is difficult. Disease of the cervical vertebræ may render the examination difficult or impossible.

Technic.—Asepsis must be carefully practised. The patient's mouth should be made as clean as possible. All instruments except the illuminating lamps can be boiled; the latter are sterilised with formol vapour.

Preparation and Anaesthesia.—The examination should be, if possible, carried out when the patient is fasting, and it is a great advantage, especially if he be nervous, to administer a quarter of a grain of morphia with atropine ($\frac{1}{100}$ gr.) about an hour before the examination. Some surgeons prefer the internal administration of bromides for several days before examination, but this is not always possible.

Local Anaesthesia.—The throat should be sprayed with an ordinary throat spray, containing 10 per cent. cocaine. Two minutes later the upper aperture of the larynx should be painted with 20 per cent. cocaine by means of a laryngeal brush or syringe, or by Sajous' cotton carrier, under the guidance of the laryngeal mirror. The cocaine solution should be slightly warmed, and the patient advised to cough and spit out as much of the solution as possible after each application. In order to minimise the unpleasant pressure of the spatula on the upper incisor teeth it may

be well to place a small pledget of cotton-wool saturated in 10 per cent. cocaine against the lower anterior part of the nasal septum of each side; by this means the anterior dental nerves are anæsthetised before they enter the anterior palatine foramen. After the first application of cocaine to the larynx the surgeon must wait for several minutes and then make a second, and even a third, application.

It is noteworthy, however, that the firm pressure of the tube spatula is more easily tolerated by the patient than the light touch of the brush.

Method of Examination.—The best instrument is Brünings' autoscopy spatula, shown in Plate I. This instrument is 15 centimetres in length, but a smaller one is made for children. The patient must loosen or remove all tight garments, and must take out his tooth-plate, if one be worn. He sits on a low seat from 20 to 30 cms. high. Special hollowed-out seats are an advantage. The room should be dark. An assistant stands behind the patient, and keeps the head and upper part of his body in the proper position. He must also keep the upper lip free from pressure, and may adjust a piece of cotton-wool over the upper incisor teeth. A second assistant stands on the right of the surgeon, and hands him all the instruments as required, presenting them in the axis of the tube. The nurse makes the cotton-wool swabs, and in cases of bronchoscopy and œsophagoscopy also manages the saliva pump when required. Light may be obtained either from Brünings' electroscope or from the Kirstein forehead mirror (see Plate I.). The spatula should be slightly warmed over a lamp, and then oiled with vaseline before introduction. The first step of examination is to bring into view the lingual surface of the epiglottis. The patient is instructed to go on breathing regularly, and to allow the assistant to move his head as required. The patient now puts out his tongue and grasps the tip of it firmly with a tongue cloth; the surgeon, standing in front of him, with his left forefinger pushes up the upper lip, while he presses the thumb of his left hand against the upper central incisors. The tube spatula is then introduced into the angle formed by the thumb and forefinger, so as to prevent it slipping to the side. The spatula is now passed backwards under the control of vision (Fig. 1, Plate II.), exactly in the middle line until the epiglottis comes into view. The distal end of the spatula is then slightly raised and passed over the free border of the epiglottis in the middle line. The patient now lets his tongue go, and at the same time his head is gently extended. The

PLATE I.
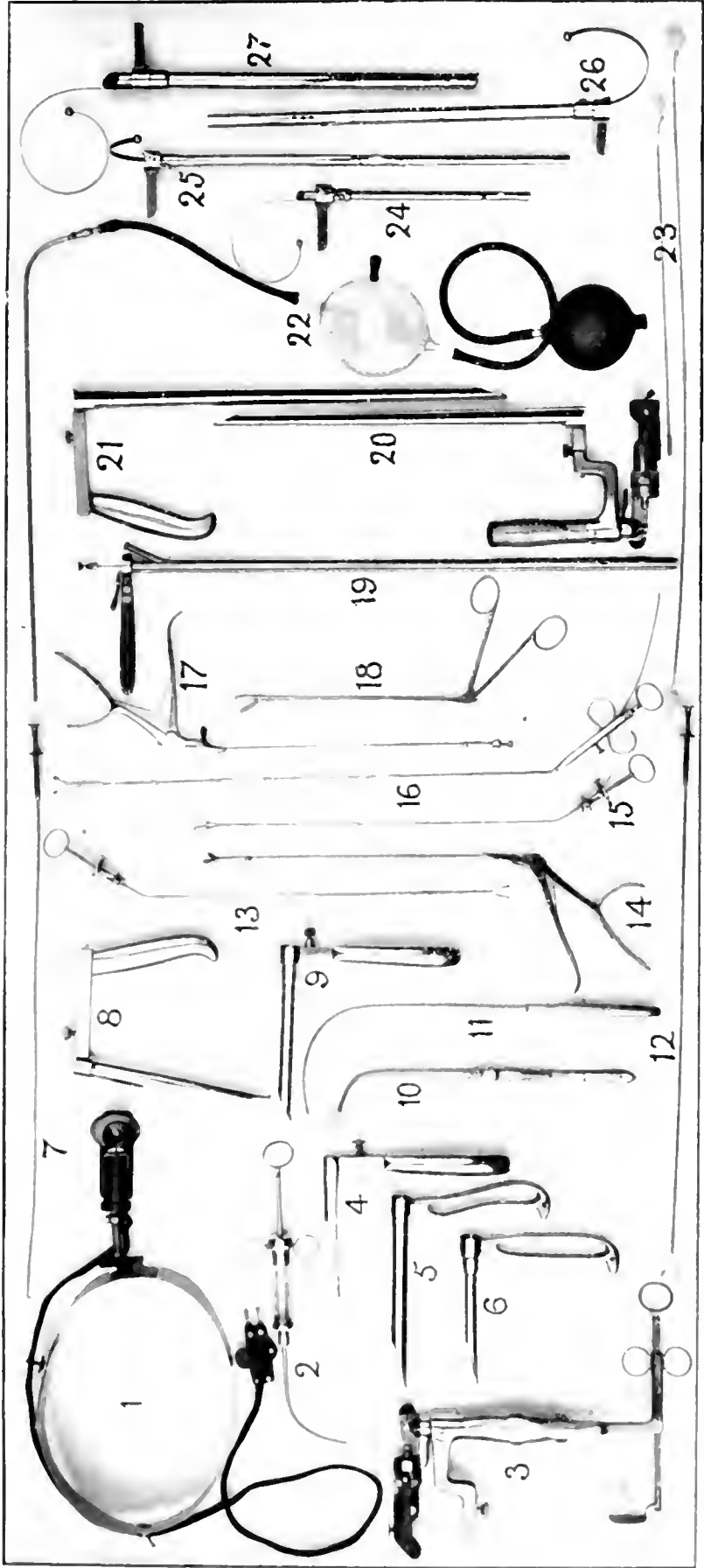
Reference to the plate (1 to 2). ... 2. Laryngeal syringe. 3. Bruning's electroscope (new pattern) with counter-pressure apparatus attached. 4. Bruning's autoscopy spatula (children). 5. ... for removing collar stud. 6. Bruning's tube-spatula (adults). 9. Paterson's tube-spatula. 10. Spoon larynges[...]ed cotton carrier. 11. V. Eicken's hypopharyngoscopy probe. 12, 13, 14, 15, 16, 17. Forceps for removal of foreign bodies, growths, etc. 18. Paterson's forceps for laryngeal growths, papilloma, etc. 19. Chevalier Jackson's bronchoscope. 20 and 21. Bills ... tubes (Bruning's new pattern, old pattern attached to 20). 22. Suction pump. 23. Long and short cotton carriers. 24 to 27. Bruning's tubes with extension ... No. 4 for infants (7 mm. diam.). 25. For children No. 3 (8.5 mm. diam.). 26. No. 2 for adults (10 mm. diam.). 27. No. 1 (12 mm. diam.) for ... oesophagus.

PLATE II.

FIG. 2.

FIG. 1.

Second stage in introduction of tube.

First stage in introduction of tube.

(After Bünings.)

PLATE III.

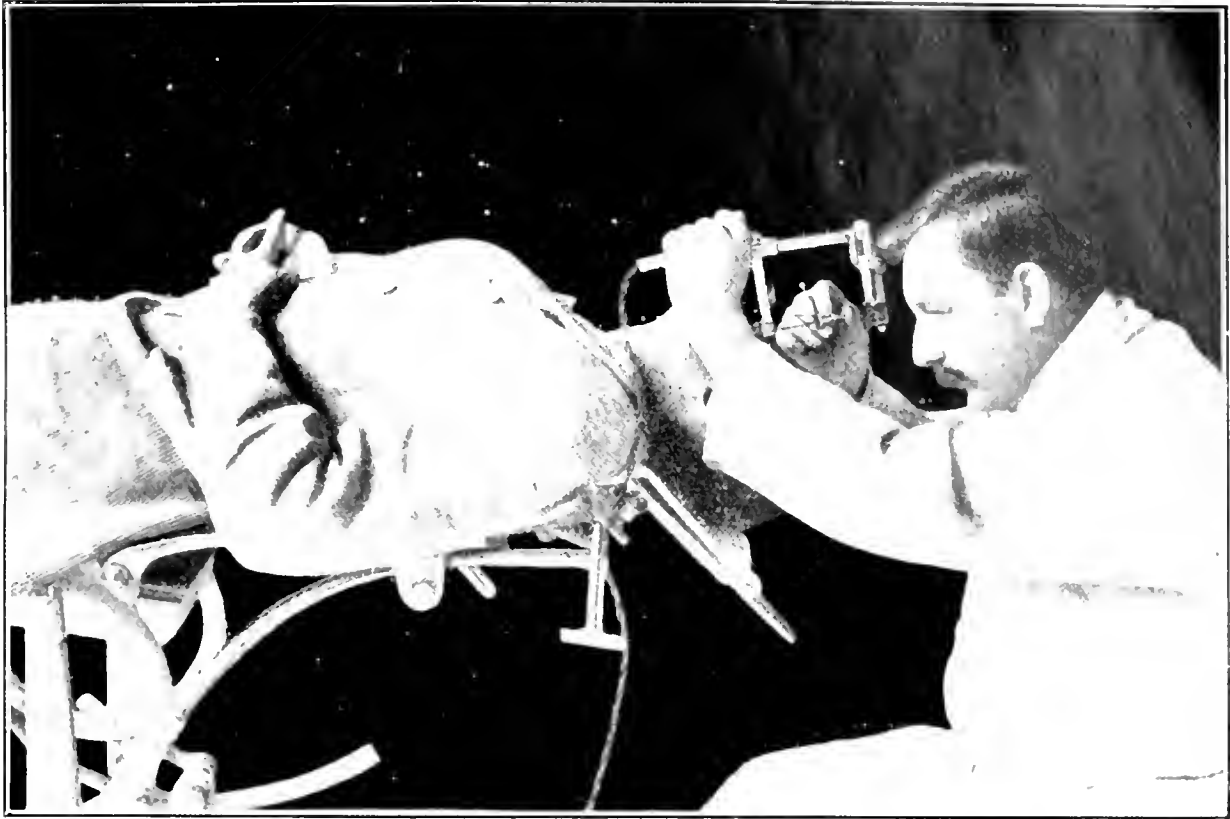Fig. 1.

(After William Hill.)

Fig. 2.

(After Brünings.)

Skiagram of injected tracheo-bronchial tree.

Fig. 3.

Showing bifurcation of trachea and main bronchi.

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Tracheo-bronchoscopy in the dorsal position showing removal of foreign body. (After Brunings.)

Fig. 2.

surgeon, keeping exactly in the middle line, next exerts a powerful forward pull with the distal end of the tube spatula on the posterior surface of the epiglottis. This is accomplished by pulling the handle of the instrument backwards and upwards, the pivotal point being at the junction of the spatula and handle (Fig. 2, Plate II.). The upper teeth must not be used as a fulcrum. During this process the patient should utter a continuous sound (eh), as this tends to diminish spasm, and also causes the arytenoid cartilages to vibrate, and so guides the surgeon in the proper direction. The tube must not be introduced too far backwards, or it will pass into the hypo-pharynx. If the surgeon is in any doubt he must withdraw the tube and start afresh. By increasing the forward pull, the posterior commissure, the posterior ends of the vocal cords, and finally the anterior commissure come successively into view (Fig. 1, Plate III.). In order to see the anterior commissure it may be necessary to use Brünings' counter-pressure apparatus, or to get the assistant, who stands behind the patient, to exert pressure with his fingers on the anterior surface of the thyroid cartilage.

Mistakes and Difficulties—The patient should be told that the examination is somewhat unpleasant, and gives rise to a slight feeling of choking. Further, it is important not to begin the examination before the cocaine has taken effect. In difficult cases it is well not to proceed beyond a view of the arytenoid region at the first sitting. The patient should be told not to bend back his head rigidly, but to leave it to the assistant, who should incline the head gradually backwards during the examination. It is very important also to see that he does not slide forward on the stool or chair; if this happens the body is inclined backwards, and examination becomes almost impossible. The whole procedure should be as short as possible, as saliva tends to accumulate, and, since it cannot be swallowed, it runs down into the larynx and trachea, and produces cough. Previous administration of atropine largely obviates this difficulty. It is important to take advantage of any gaps in the patient's upper row of teeth, although it must be remembered that autoscopy from the corner of the mouth is not so easy for the surgeon as in the middle line. If the patient be tractable it is an advantage to practise autoscopy from behind, because this forms a good training for the passage of tubes when the patient is lying on his back on the operating-table.

The cases here recorded are introduced in order to illustrate

some of the conditions of the larynx for which the direct method is of value, namely, the inspection of the larynx in young children, the treatment of tubercular disease, and the removal of simple tumours, such as papillomata.

CASE I.—*8th March* 1911.—C. S. (male), aged 2 years, has had dyspnœa for two months, and, when excited, well-marked inspiratory stridor. 11*th March* 1911.—Direct laryngoscopy (A. L. T.) showed slight diffuse infiltration of posterior wall of laryngeal cavity and of posterior parts of true cords; no papilloma. Tracheotomy had to be performed the same evening on account of dyspnœa. 30*th May* 1911.—Second direct laryngoscopy showed swelling of posterior part of laryngeal cavity. 21*st August* 1912.—Child readmitted for observation during and after removal of tube. 5*th September* 1911.—Tracheotomy wound closed; child doing well.

CASE II.—R. W. (male), aged 3 years. Patient was admitted to City Hospital on 30th May 1910 as a case of diphtheria.

There was a history of sore throat and vomiting, shivering, and noisy breathing for two days. No membrane was visible, but as the breathing was difficult the patient was intubated on the evening of admission.

The tube was removed on the 3rd and again on the 5th of June, but on both occasions had to be replaced. On the 7th and 8th of June the tube was coughed out and was only replaced with difficulty.

Tracheotomy was performed on 8th June. Thereafter attempts to intubate were unsuccessful, as the tube stuck at the level of the cords. Swabs from the throat were uniformly negative.

27*th July* 1910.—The child examined under chloroform (A. L. T.). The upper aperture of the larynx was found normal, but the tracheotomy tube could not be seen through the glottic chink.

3*rd August* 1910.—Second direct examination (J. S. F.). Upper aperture normal. The posterior ends of the true cords were seen, but there was no opening of the glottis on inspiration, the anterior ends of the true and false cords being apparently firmly united. A probe could not be passed between the cords to reach the tracheotomy tube, and after removal of the tube a probe could not be passed upwards into the larynx.

CASE III.—A. M‘V. (male), aged 3 years, was admitted to Colinton Fever Hospital early in February 1911 suffering from laryngeal obstruction. Dr. Ker had great difficulty in intubating, as there seemed to be sub-glottic œdema. When the time came to remove the tube the dyspnœa was as severe as before, so tracheotomy was performed. During this operation pus escaped, and since then the child has been unable to breathe without the tube.

There was never any membrane formation or faucial lesion. Cultures negative.

The boy was seen at the Ear and Throat Department on 21st March 1911. When the tube was removed a tough granulation was found projecting from the lumen of the air-passages (A. L. T.).

On direct laryngoscopy the upper aperture of the larynx was normal, but the glottic chink only admitted a probe. No attempt was made to pass the tube through the larynx.

Subsequently laryngo-tracheostomy was performed.

CASE IV.—M. S. (female), age 21, was admitted on 23rd February 1909. She had recently cut her throat, and tracheotomy had been performed—at first the high, and later on the low, operation. On admission the patient was unable to do without her tracheotomy tube. On removal of the tube it was noticed that a large granulation was blocking the tracheotomy opening.

Indirect laryngoscopy showed that the vocal cords appeared thickened and lying close together (A. L. T.).

Schroetter's tubes were passed, and the patient could breathe more easily while the tubes were in position.

21st *March* 1909 —Considerable narrowing of larynx; practically no air passing through the natural passages when the tracheotomy wound was closed.

26th *March* 1909.—Direct lower tracheoscopy showed lower part of trachea free, but upper part quite filled up.

5th *April*.—Laryngostomy was performed.

CASE V.—16th *May* 1911.—B. H. (female), age 22, complained of hoarseness and slight expectoration for 3 months. On examination, the pharyngeal and palatal mucosa was pale, and there was a marked pyramidal interarytenoid swelling; the vocal cords were pink and the edges rounded. Bronchial breathing was present at the right apex, and von Pirquet's reaction was positive.

On 3rd June 1911 the interarytenoid swelling was removed by the direct method (J. S. F.) under local anaesthesia, and the patient was thereafter admitted to the Victoria Hospital, and subsequently to the Farm Colony at Polton.

13th *November* 191 . Voice clear; interarytenoid swelling gone; still slight swelling of left cord; patient has gained a stone in weight in six months.

CASE IV.—J. A. (male), age 11, was seen 9th October 1908. The boy became hoarse one year before admission, and the trouble has gradually increased. There is no difficulty in breathing. On indirect laryngoscopy a large papilloma was seen growing from the anterior commissure and projecting between the vocal cords. Direct laryngoscopy (A. L. T.). Part of the tumour was removed and reported on as a papilloma.

25th *December* 1908. The patient took scarlet fever, and was removed to the City Hospital.

1st April 1909.—Second direct laryngoscopy (A. L. T.). Tumour again removed.

27th February 1910.—At the third direct examination tumour again removed.

June 1911.—Fourth removal of a tumour by direct method.

21st September 1911.—No trace of recurrence of tumour.

Case VII.—M. L. (female), aged 9 years, was seen in August 1908. The child had been hoarse for two years, and for the last two months had suffered from severe dyspnœa and attacks of choking. Tracheotomy was performed one month ago in the Sick Children's Hospital. Indirect examination showed large papillomata in the larynx. Thyrotomy was performed on 24th August 1908 (J. S. F.). A large mass of papillomata was removed from the ventricle of the larynx on the left side, and a small growth from the ventricle on the right side. The base was canterised on both sides, and the incision in the thyroid cartilage closed. The child was sent home on 23rd September, the voice being much improved and dyspnœa entirely absent.

23rd October 1909.—Voice fairly good. No dyspnœa. Vocal cords move well, but are rather pink. No recurrence of growth.

27th December 1911.—Patient re-admitted on account of severe dyspnœa at night.

28th December 1911.—Morphine and scopolamine given. One hour later chloroform administered. Papillomata removed from both false cords by the direct method (J. S. F.).

18th October 1912.—The child improved for a considerable time after the second operation, but of late the difficulty in breathing has returned, and the voice has become very husky. On examination there were still papillomata on the right side, growing from the false vocal cord. A further intra-laryngeal operation was performed by the direct method on 27th November 1912 under general anæsthesia, and a papilloma was removed from the left false cord and another from the right true cord.

Tracheo-Bronchoscopy.

Anatomical Considerations.—When the patient is in the upright position the tracheo-bronchial tree has the form of an inverted **Y** (Fig. 2, Plate III.). At its lower end the trachea deviates to the right, because the arch of the aorta curves round the left main bronchus and passes close to the left wall of the trachea. The right main bronchus is wide and more in the axis of the trachea than the left: the right bronchus comes off from the trachea at an angle of only 25°, while the left main bronchus comes off at an angle of about 45°. The bifurcation ridge or carina at the lower end of the trachea is considerably to the left of the middle line (Fig. 3, Plate III.). The right main

bronchus in direction and calibre does not differ markedly from the trachea, so that on passing the tube down the trachea it is easy to miss the left main bronchus unless we closely watch the left wall of the trachea. This wall shows the pulsations of the aorta. The bronchus to the upper lobe on each side comes off laterally, that on the right side (eparterial) coming off at a shorter distance from the bifurcation than on the left side. It is very easy to miss these openings, unless one remembers to give a lateral direction to the tube.

With regard to the surface markings the bifurcation of the trachea is situated behind the sternal end of the second costal cartilage in adults: regarded from behind it is at the level of the spinous process of the fourth dorsal vertebra. In children the bifurcation is at a slightly higher level (first costal cartilage and third dorsal spine). The length of the trachea from the vocal cords to the bifurcation is nearly bisected by the upper limit of the thorax. The distance from the upper incisor teeth, when the head is extended, to the bifurcation is 26 cm. in men, 23 cm. in women, and 17 cm. in a child of 10 years. The diameter of the trachea varies in men from 15 to 22 mm., in women 13 to 18 mm., and in children from 8 to 11 mm., but the width of the glottis, which regulates the size of tube employed, is in men 12 to 15 mm., in women 10 to 13 mm., and in children 8 to 10 mm.

It is worthy of note that if a tube can pass the larynx without difficulty it can also enter the two main bronchi. The tubes usually employed are for men 12 mm. in diameter, for women 10 mm., and for children 8·5 mm.; in infants of four or five months a tube of 7 mm. diameter may be used, but in very young infants tracheotomy must be performed, as it is impossible to work with a tube of less than 7 mm. diameter. The bifurcation and large bronchi descend about 1 cm. with deep inspiration. In adults, during calm breathing, there is little or no change in the calibre of the bronchi, but in children the air-passages contract during expiration, so that one can only obtain a good view during inspiration. Pulsatory movements at the bifurcation are easily seen; these are of course due to the action of the heart and aorta. Regular systolic pulsation of the lower part of the tracheal wall can also be seen. This may be much greater in cases of aneurysm, and the bronchoscope, when passed into the left main bronchus, can be seen and felt to pulsate. All pulsations are greater during expiration and less during inspiration.

The mucous membrane of the trachea and bronchi, as seen

through the tube, appears white on the ridges where it covers the cartilage and pinkish in between.

Indications for Tracheo-Bronchoscopy.—1. Foreign bodies.

According to Jackson, over 80 per cent. of foreign bodies may be removed by bronchoscopy. Failures are due to the foreign body having become embedded, or to the serious condition of the patient before operation. Bronchoscopic removal has a mortality of only 9·6 per cent., whereas the "let-alone" method has a death-roll of 27 per cent.

The symptoms in a case of foreign body are as follows:—Cough —at first paroxysmal, but later on becoming more or less constant : dyspnœa—usually inspiratory—made worse by attacks of cough-ing ; the temperature is usually elevated ; hæmoptysis is rarely present, and pain is of no great diagnostic value.

The diagnosis of foreign bodies can frequently be made by means of the X-rays, especially if the body be metallic. Hard, dense pieces of bone may also show well on the plate if they do not overlie the vertebral column. A negative radiogram, how-ever, does not mean that tracheoscopy should be omitted. It is, of course, also necessary to examine the chest by the usual methods.

2. Cases of irritative cough where ordinary treatment has failed : in these, local applications of silver nitrate solution to the bronchial mucous membrane may result in cure.

3. Localisation of pulmonary disease for external operation, *e.g.* abscess of the lung.

4. Peri-tracheal and peri-bronchial stenosis due, for example, to enlarged mediastinal glands, malignant tumours, goitre, and enlarged thymus. The advisability of direct examination in cases of aneurysm is disputed, and on the whole the balance of opinion seems to be against tracheoscopy in such cases.

5. Tracheal and bronchial stenosis, as, for example, stenosis resulting from foreign bodies, syphilis, tuberculosis, and scleroma.

6. Simple tumours of the trachea.

Contra-Indications. — Advanced cachexia, marked arterio-sclerosis, aneurysm, and heart disease are contra-indications unless for some very special reason such as a foreign body. In cases of tubercular disease of the spinal column and of large tumours or abscesses pressing on the trachea the direct examina-tion may cause death. If severe dyspnœa is produced merely by bending the patient's head backwards, upper bronchoscopy should not be attempted, and tracheotomy should be performed.

If the stenosis be in the larynx, improvement immediately results.

The trachea and bronchi may be examined by the passage of tubes through the mouth and larynx (direct upper tracheo-bronchoscopy), or by the passage of the tube through an old or recent tracheotomy opening (direct lower tracheo-bronchoscopy). Lower bronchoscopy should be performed (1) if there be already a tracheotomy opening, (2) if the patient be under 6 years of age, (3) in cases of large foreign body, (4) if severe dyspnœa be present. In about 20 per cent. of cases, even in adults, upper bronchoscopy has to be followed by the low method. It is advisable in many cases to perform tracheotomy, and to pass the tube through the new opening rather than prolong attempts at upper bronchoscopy.

Asepsis and Instruments.—It is almost needless to point out the excellent drainage of the air-passages by ciliary action and coughing, so that unless there has been considerable injury to the lungs there is little danger of septic pneumonia even from foreign bodies such as diseased teeth getting into the air-passages. It is absolutely impossible to pass a bronchoscopic tube aseptically through the mouth, or to exclude the entrance of saliva into the air-passages. All instruments can be boiled except those concerned in illumination. If lower tracheoscopy be called for, all tubes and instruments which have been previously used through the mouth should be re-sterilised. The tubes advised for the different sexes and ages have already been mentioned, but it is advisable to have at hand the adjoining sizes, so that if necessary the tube can be changed without loss of time. The length of the forceps must be adjusted to that of the tubes used. This is easily done, as the length of the tubes can be read off by the markings on the outer surface of the barrel or of the extension apparatus. The saliva pump and suitable wool carrier should both be ready. 10 per cent. cocaine and adrenalin solution must be at hand. The tracheotomy instruments must not be forgotten.

Anæsthesia.—Once the larynx has been passed, very little cocaine is required in the trachea until the bifurcation is reached. Some authorities (Killian) recommend blind painting of the trachea and bronchi, but it is probably better to apply 10 per cent. cocaine on cotton swabs under the control of vision through the bronchoscopy tube. In cases in which the lining membrane of the tubes is inflamed, 20 per cent. cocaine solution is necessary. The question of the previous administration of bromide or of morphia and atropine has already been considered.

Anæsthetic for Lower Direct Tracheo-Bronchoscopy. — After tracheotomy has been performed the interior of the trachea may be anæsthetised with the painting syringe. If tracheotomy has been performed some considerable time before the examination it is very necessary to cocainise the region of the opening itself. It is not necessary to see what one is doing, at any rate in the case of the right bronchus, for the cocaine swab can be passed obliquely from the left side of the tracheotomy opening into the right bronchus, but for the left main bronchus it is better to apply cocaine under the guidance of the eye. In cases of foreign body only the immediate neighbourhood of the tracheotomy opening should be cocainised blindly; beyond this the drug should be applied under the control of vision. If tracheo-bronchitis be present 20 per cent. cocaine must be used.

Position of the Patient.—The sitting position is very much easier for the surgeon, but it must be remembered that swallowing is almost impossible when the tube is in position, and that saliva can trickle down between the tube and the walls of the larynx and trachea and collect in the lower bronchi, and so excite a cough. For this reason the lying position is to be preferred if the examination is to last more than 10 minutes. On the other hand, especially in elderly or stout patients, the horizontal position with the head over the end of the table is extremely disagreeable.

Introduction of the Tube.—The first part of the procedure takes place, as already described, under direct laryngoscopy (p. 8). The distal end of the tube is passed into the larynx and then turned through a right angle, so that the bevelled end of the tube spatula is parallel to the margins of the vocal cords. The patient is told to take a deep breath, and as the cords separate the tube is passed downwards between them into the trachea.

Introduction in the Lying Position.—The examination may be carried out either with the patient lying on his back or on his left side. The operating-table must be raised by supports, or a special table must be used; if the patient be on his back, the head must be at first slightly extended over the end of the table and held by an assistant who sits on the patient's left. It is very important that this assistant should himself be comfortably seated, and should have a support for his feet, so that he may rest his right elbow on his knee, and so hold the patient's head without jerking. The other assistant stands on the surgeon's right and hands him the instruments. The bronchoscopic tube is now introduced and passed backwards along the dorsum of the tongue, the left hand being

used to protect the patient's upper teeth and lip. After the epiglottis has been passed the head is lowered, and the surgeon sits down with his head on a level with the patient's mouth (Fig. 1, Plate IV.).

Introduction in the dorsal position is difficult, because the normal relations of patient and surgeon are reversed, and also because the instrument has to be introduced in an awkward position. If the introduction in the dorsal position is very difficult or impossible, the patient should be asked to turn on to his left side. In this way the tube can be introduced exactly as in the sitting position, the surgeon standing on the left side of the table and facing the patient, while the assistant stands behind the patient and supports the head. Once the tube has been passed into the trachea the patient should be carefully moved on to his back, because the lateral position is very tiring for the surgeon. After passing through the larynx one notices that the posterior wall of the trachea projects forward below the cricoid cartilage. For this reason the distal end of the tube should be directed forwards, so that the lumen may be followed. When examining the right bronchus the proximal end of the tube should be directed towards the left corner of the patient's mouth. Force must never be used, and is quite unnecessary if the tube is always kept in the lumen of the trachea and bronchi. Only in examining the secondary bronchi is it ever necessary to use force. In order that the patient may be able to breathe during this examination, the extension tubes for bronchoscopy have perforations of the wall, so that the air may pass freely into and out of the bronchus which is not under examination. Short examinations are not followed by severe after-effects, though there may be a little discomfort in the larynx and hoarseness for a day, but after prolonged examinations, especially in children, there is some danger of subglottic swelling which may require tracheotomy. Oxygen inhalations may be useful in such cases.

Difficulties and Mistakes.—It is important to anaesthetise the larynx sufficiently, as otherwise coughing will be set up which greatly interferes with the examination. The expired air is driven straight against the eye of the surgeon, and for this reason it is an advantage for him to wear glasses.

Direct Examination on Children.—This is very difficult on account of the very small diameter of the tubes (7·6 mm.), which must be used. Further, children are very restless, and there is great tendency to spasm and salivation. There is,

moreover, considerable danger of cocaine poisoning. It is very important, however, to be able to carry out such examinations, as 47 per cent. of foreign bodies occur in children below 6 years of age. Brünings advises the use of his universal electroscope for children. The cocaine solution should never be stronger than 10 per cent. General anæsthesia is more often necessary than in the case of adults. Children may, however, be examined in the upright position, that is to say in the position adopted in continental clinics for the removal of adenoids. On the other hand children are very plastic. As a rule a gag must be used. Frequently a view of the parts is only obtained during inspiration, as there is great tendency to spasmodic closure of the larynx. The powerful closing movements of the air-passages are very striking. During forced expiration the lumen is almost completely obliterated. Frequently lower direct bronchoscopy must be used.

The three cases of tracheo-bronchoscopy illustrate—(*a*) the diagnosis of an intra-tracheal new growth, (*b*) the diagnosis of stenosis of a bronchus from mediastinal glands, (*c*) the removal of a foreign body from the right main bronchus.

CASE I.—*20th August* 1909.—M. M‘C. (male), aged 31. Patient was admitted to Professor Wyllie's ward on 14th May 1909 suffering from dyspnœa and a choking sensation, and found to have complete paralysis of the left recurrent; a radiogram showed a shadow in the upper thoracic region. This was taken to be an aortic aneurysm.

On 6th August dyspnœa increased and prevented sleep. Patient sweated profusely. He was therefore transferred to Professor Alexis Thomson's ward, and low tracheotomy was performed under local anæsthesia. The patient sat bolt upright during the operation. An ordinary tracheotomy tube was inserted, and as this did not give relief a rubber drainage tube was passed through it down to the bifurcation of the trachea. As a result the patient became less cyanosed and breathed more easily. There was a great tendency for the tube to become blocked with mucus.

7th August.—Patient slept fairly well. The rubber tube was withdrawn to-day, but had to be reinserted, as he found that he could cough better by nipping the rubber tube and then allowing the air and mucus to escape suddenly during a violent expiration. During the following week the patient remained *in statu quo*, but slept very little in spite of hypnotics. He threatened on several occasions to commit suicide.

20th August.—Patient sent down to Ear and Throat Department by Professor Thomson. Direct lower tracheo-bronchoscopy carried out (J. S. F.). In spite of morphine and atropine there was profuse mucopurulent secretion in the trachea, which rendered the examination difficult. Just at the bifurcation a reddish-purple fungating mass was

found almost occluding the right main bronchus and partially occluding the left. The condition was regarded as malignant, and microscopical examination of a small piece removed confirmed this diagnosis (sarcoma, mixed, round, and spindle celled).

After this examination the case was seen to be hopeless, and more morphia was given. The patient died the same evening.

Post-mortem.—Large sarcomatous mass was found above the base of the heart and round the great vessels and trachea. The infiltration of the lower end of the trachea and of the main bronchi was confirmed. There were numerous isolated growths in the lungs which had pressed on the bronchi and produced bronchiectatic cavities.

CASE II.—J. L. (male), aged 42, was seen on the 8th of August 1912, at the request of Mr. Cathcart. The patient complained of difficulty in breathing and hoarseness of three months' duration. He had had cough and expectoration for many years, and there was marked clubbing of the fingers. He also complained of pain in the right shoulder. On examination (J. S. F.) the right vocal cord was seen to be fixed in the cadaveric position, but the left cord moved well. The opinion given was that the position of the vocal cord did not account for the severe dyspnœa present. The patient was therefore admitted to Ward 27, and was again sent over to the Ear and Throat Department on 1st September 1912 for indirect examination. It was found to be impossible to carry out this examination under local anæsthesia, and chloroform was therefore given. Before the patient had been got under chloroform the breathing stopped suddenly and tracheotomy had to be rapidly performed (J. S. F.). The operation only relieved the breathing to a slight extent, and on holding the edges of the trachea apart it was noticed that there was marked narrowing of the lumen and swelling and congestion of the walls.

16th September 1912.—*Direct bronchoscopy* (A. L. T.).—The upper end of the right main bronchus was seen to be narrowed, but no ulceration of mucous membrane was detected. The stenosis was regarded as the result of pressure from peri-bronchial glands.

25th September 1912.—Patient died.

26th September 1912.—*Post-mortem Examination.*—A mass of tuberculous tissue was found in the mediastinum pressing on the posterior wall of the trachea opposite to the tracheotomy opening. A smaller mass of tissue was found at the bifurcation of the trachea pressing on and partially occluding the right main bronchus.

CASE III.—*23rd June* 1911.—W. B. (male), aged 7 years, was sent over to the Ear and Throat Department by Professor Caird. Five weeks before admission the boy was holding a small metal pipe out of a "lucky bag" in his mouth as he ran about. He inspired it by mistake, and since then has worked his shoulders as he breathes, and his expiration has been accompanied by a wheezing noise. No pain and no

dysphagia. The boy soon loses his breath now when he plays games. Patient's doctor states that the boy's parents thought he was suffering from asthma, and only heard about the "lucky bag" incident a few days ago. Examination showed deficient vocal fremitus on the right side behind and below the scapula; over this area the breath sounds were faint, whereas in the interscapular regions the breath sounds were loud and blowing, and there was a marked rhonchus at the beginning of expiration. Percussion showed hypertympanitis over right base. Radiograph showed a foreign body (pipe) on the right side lying obliquely at the level of the intervertebral disc between the 4th and 5th dorsal vertebræ (Fig. 2, Plate IV.). Child admitted and radiographed for second time just before operation; foreign body seen *in situ, i.e.* in right main bronchus. *25th June* 1911.—One hour before operation morphine, $\frac{1}{12}$ gr., and atropine, $\frac{1}{120}$ gr., given hypodermically. Chloroform given with child in dorsal position on table; head brought over end; larynx cocainised (5 per cent.) through Killian's tube spatula.

Brünings' No. 4 tube (7 mm. diameter) passed through larynx (A. L. T.) without difficulty. Slight coughing when trachea was reached, and therefore more cocaine applied. The metal pipe was clearly seen lying in the right main bronchus with the stem upwards. No excess of secretion was present (atropine ?). Foreign body was grasped with Brünings' extension forceps but would not enter the tube; it was withdrawn as far as glottic chink along with the bronchoscopic tube, but at this point it stuck and the forceps slipped off. A second introduction of the outer tube enabled Dr. Turner to grasp the body with Paterson's forceps; the stem of the pipe broke off and was removed, and the bowl was extracted at the next attempt. Careful exploration of the trachea and main bronchi now showed that all was clear, but the vocal cords had been slightly bruised in the extraction of the pipe. *26th June* 1911.—Slight laryngeal obstruction present this morning and increased during day; tent and steam kettle; weak adrenalin spray to larynx. *27th June* 1911.— Dyspnœa and cyanosis increased, and tracheotomy was performed under chloroform at 10 A.M. *1st July* 1911.—Examination of chest shows only slight rhonchi. *2nd July* 1911.—Tube removed without difficulty, *8th July* 1911.—Discharged cured.

(*To be continued.*)

THE FUNCTION OF THE ROYAL MEDICAL SOCIETY IN MEDICAL EDUCATION.[1]

By ROBERT HUTCHISON, M.D., F.R.C.P.

MR. PRESIDENT AND GENTLEMEN,—It seems but the other day though it is now not far short of twenty years ago, when I had the

[1] An address at the opening of the Society in October 1912.

honour, as Senior President of this Society, to introduce the giver of the opening address for that session—the late Sir William Broadbent—and now I find that I am myself in the responsible and honourable position which he occupied on that occasion. It is an honour which has usually been reserved for the grave and revered seniors of the profession—amongst whom I am happy not yet to count myself—but there is perhaps an advantage in your being addressed by one who stands nearer to your own generation, and who is far enough removed from student days to see them in some sort of perspective, yet not so far that the details have become blurred in the mist of years. Looking back, then, upon those days I ask myself what the Royal Medical did for me as a student, and what, by inference, it may do for you. What, in other words, is the function of this Society in the education provided by the Edinburgh School?

That is the subject to which I have to ask your attention this evening, and if you want a text for my discourse you may find it in the well-known words of Bacon:—" Reading maketh a full man ; conference a ready man ; and writing an exact man." For you have in this Society facilities for the employment of each of these methods of mental training. You have a library which ranks amongst the great medical libraries of this country, you have this ancient hall in which to conduct your conferences or debates, and you have still, as a compulsory duty of each of your members, the writing of what is quaintly termed in our rules a "dissertation." Let me enlarge for a few minutes on each of these aspects of the Society's life.

I put reading first, for unless the minds of your members be full your debates will be but as sound and fury, signifying nothing.

It is true, of course, that books play but a minor part in the training of a medical student. Most of your reading must be in the book of nature—in the dissecting-room, the laboratories, and the wards of the Infirmary—but the wisdom and experience of our predecessors, recorded in the printed page, has its lessons for you too. I hope, therefore, that you will make large use of the library, remembering that the time is not far off when for many of you the exactions of practice will leave but little time for reading, and that you will learn here to love a library, even the smell of one, and to feel at home in it. You should learn also to know your way about amongst medical books, for, as it has been remarked, the next best thing to knowing a thing is to know where to find it, and in these days when the accumulation of scientific knowledge

has become so vast that no mind can contain it, it is more than ever necessary for you to know the "authorities" and where to turn for your facts. To have learned even to understand the mysteries of the *Index Medicus* is to have grasped the key which can open for you endless possibilities of information.

Some of you may remember that Dr. Johnson advised Boswell always to have books about him, so that he might read upon any subject upon which he had a desire for instruction at the time, "for," he added, "if a book is not ready and the subject moulds in the mind it is a chance if you have again a desire to study it." It is in that spirit that you should use the reference section of the library. It should contain the latest editions of the standard text-books and Systems, and you should turn to it when any question arises in your mind which wants answering, or when you have an interesting case in the wards which you want to learn more about or to compare with the classical description. The essence of the matter is that your reading should be with the object of supplying answers to questions which have already arisen in your mind. It should not be aimless or discursive. The "desire for instruction" on some particular point must be there first.

You are peculiarly fortunate, gentlemen, in that your library is rich in old books. Do not despise these, for we have much, even the youngest of us, to learn from the older writers. Read especially the lectures of Trousseau, Watson, Graves, and Stokes, and of Todd, and King Chambers, and the other clinical writers of the middle of last century. You may think little of their science, but you will find in them an admirable exposition of the art of medicine on the therapeutic side which will serve as a useful corrective to the too exclusively pathological or laboratory outlook which tends to prevail to-day. You will learn from them, also, what your modern reading might not allow you to believe, that scientific writing is not incompatible with the use of a pure and luminous literary style. Further, by a wide study of the medical classics you will acquire a proper perspective, and will learn, I think, not without some humiliation, that there were great men even before Agamemnon, and that there are few new things under the sun. For you will find that facts which you believed to be new have often been discovered long ago, though perhaps their significance was unknown, but have remained buried under the constantly accumulating dust of the medical workshop, and that many ingenious theories which you have pleased yourself by think-ing had originated in your own mind are really only old heresies

re-incarnated which have long ago died a natural death or have been knocked on the head and decently buried.

I think, gentlemen, that you are obliged, from motives of economy, to exercise some parsimony in the amount of periodical medical literature which you supply to your members. And in this I think you are perhaps fortunate, for the journals are not wholesome fare for the mind of the student. They may fill him, indeed, but it is often merely, as has been said of a vegetarian diet, "with wind and self-righteousness." The tendency of the young to go after new gods is always strong enough as it is, and your teachers, if they are alive to their responsibilities, will give you as much of the "latest knowledge" as is good for you. "Thoughtfully taken," however, as Calverley said of tobacco, current literature has its uses. It gives you a glimpse into medical history in the making which is necessary to complete that sense of perspective which, as I have already said, it should be your aim to acquire, and it conveys a feeling of actuality which is often absent from the arid statements of the text-books. You realise from it that the matters you hear discussed in your class-rooms are not merely academic exercises but living questions which you in your day must help to solve, and that you are engaged in the study not of a cut-and-dry science but one which has no finality, and is daily evolving under your eyes. Those journals which reflect the current teaching in other centres—and I am glad to see several of these on the library table—should be of special use to you, for they will give you the point of view of other schools, and save you from that narrow and parochial outlook which is the besetting temptation of all loyal students, and of Edinburgh men no less than others.

There is only one thing I regret about the library, and it is that it has no department devoted to non-medical literature. This is a pity, for the opportunities of the medical student, especially if he lives in lodgings, for cultivating a taste for literature are not great. When wearied with the aridities of your text-books it is a great mental refreshment to turn to more imaginative pages, even although a knowledge of them is not demanded by the examiners, nor will you be the worse doctors for being well-read men. You want to be educated as well as instructed, and to have trained powers of thought and imagination, which is the basis of sympathy, as much as medical experience, and these qualities can only come from a wide general culture. Only by that means, too, can we acquire and retain the respect of

the public. The ideal to aim at, as a friendly critic of our pro-
fession has said, is that the doctor, even in the slums, should be
as well educated as the barrister, as devoted as the parson, and as
well paid as the publican! I hope, therefore, that your committee
will soon see its way, in spite of its straitened finances, to
obtain for the Society a subscription to a circulating library. The
money would be well spent, and it would enable the Society in
the widest sense to minister to that mental fulness spoken of in
my text.

If the wise use of the library should fill the mind, partici-
pation in discussion in this hall should impart the quality of
readiness. And in the first and most obvious way it should make
you ready of speech. The beginnings, it is true, may be painful. I
well remember the knocking of knees and general vaso-motor dis-
turbance with which I rose on a back bench to make my first confused
contribution to a debate here, but it is worth while to persevere, for
unquestionably the capacity to state one's opinions clearly in
public is becoming of increasing importance in our profession.
More and more we are being looked to by the laity for advice and
guidance in all sorts of matters, political and social, which
formerly were hardly thought to fall within our sphere. The
doctor is no longer merely a private and confidential adviser, he
is becoming a public guide, counsellor, and friend as well, and if
you are to be able in your professional life to respond adequately
to this call upon you it is important that you should have the
power of clear and persuasive public speech. Those of you who
have read the charming autobiographical chapters in the life of
the late Sir James Paget will remember how he recognised the
important share which his wonderful oratorical gifts had had in
contributing to his professional success, and the advice which he
gives as to their cultivation by others, and since his time it has
become even more important for the profession to be able to
impress its views clearly upon the public through the mouths of
its members. Now I think, so far as my observation goes, that
Edinburgh men have usually possessed in a degree greater than
that of their fellows the gift of speech. It may perhaps be in
part the outcome of that love of sermonising which runs in
Scottish blood, but I have no doubt that it is due also in no
small measure to the early training received in this hall. The
power of imparting instruction by lectures is carried in this
school to a high pitch of perfection, and I think you will find that
most of your professors and lecturers will admit that they learnt

the first rudiments of the art of exposition at the Royal Medical debates. I sometimes think, indeed, when I hear lecturing disparaged elsewhere, that it is the exponents of the method who are at fault, and that they are suffering from the want of an early training such as you can get here. To those of you, therefore, who have the honourable ambition to become teachers, participation in the debates is of special importance.

A more important gain from practice in conference, however, than mere fluency of speech, which, after all, unless it comes from fulness of mind, is but a dangerous gift, is that it makes your knowledge ready and available. Ours is a practical art. You have to be prepared "to turn a keen, untroubled face home to the instant need of things," and have all your knowledge ready for an emergency, and this can only be if it has first been woven into the warp and woof of the mind by the criticism of public discussion. It used to be said by one of our most learned teachers—Professor Crum Brown—that a student should have his knowledge "indexed both ways," meaning that it should not be so lodged in his mind that it only came out as by a reflex process if you stimulated the proper terminal, but should have become incorporated with the rest of his mental furniture and seen in its relation to other facts—in a word, should have become vital. For ours is a living profession, and dead knowledge is of no use to us, but it can only become vital if it is turned round and looked at from every side in the give-and-take of discussion.

Debate, also, should make you teachable. It should accustom you to hear all sides, to weigh evidence—perhaps the most important mental attribute of the practical doctor—and to keep an open mind. This point has been so well put by Robert Louis Stevenson that I hope you will allow me to quote the passage. (You will find it in one of his College papers.)

"The life of the debating society is a handy antidote to the life of the class-room and quadrangle. . . . It is a sad sight to see our heather-scented students, our boys of seventeen, coming up to College with determined views—roués in speculation — having gauged the vanity of philosophy or learned to shun it as the middleman of heresy, a company of determined opinionists, not to be moved by all the sleights of logic. What have such men to do with study? If their minds are made up irrevocably, why burn the 'studious lamp' in search of further confirmation? Every set opinion I hear a student deliver I feel a certain lowering of my regard. He who studies, he who is yet employed in groping for his premises, should keep his mind fluent and sensitive, keen to mark flaws, and willing to surrender

untenable positions. He should keep himself teachable or cease the expensive farce of being taught. It is to further this docile spirit that we desire to press the claims of debating societies."

Further, by taking a part in the debates here you will be initiated into the duty of the sharing of knowledge. It has ever, as you know, been an honourable tradition of our profession that the knowledge and experience of its individual members should be made common property from which all alike can benefit, and you should early cultivate the habit of pooling your share—of putting it into what the lawyers call " hotch-pot." You don't want, I am sure, to belong to those parasitical members of our fraternity who keep to themselves all they have learnt or thought, whilst availing themselves freely of the contributions of others to the common stock. Bring here then for discussion and consideration your contributions, no matter how small they may seem, whether an interesting case you have seen in the wards or in dispensary work, a rare pathological specimen, or some fruit of your own thought, for in this way your own ideas will be enlarged and clarified and the life of the Society enriched, remembering that " thoughts shut up want air and spoil, like bales unopened to the sun." By so doing also you will fit yourselves for what should be an important part of the social life of your profession in later years, for membership of the local societies which are now so widespread throughout the country, and which do so much to keep alive the intellectual life of the profession. In the founding and maintenance of these old Royal Medical men ought always, in gratitude for what this Society has done for them, to take a leading part.

But in addition to mere intellectual readiness, gentlemen, you should reap also from your debates, if you participate in them in the right spirit, considerable moral advantage. You will learn to form a just estimate of your own powers, and should discover that the man who shines in the examination hall is not always the best man here. You will learn to listen patiently to views with which you are in disagreement, and perhaps even, though that is for some a hard lesson, to suffer fools gladly. Some measure of self-control you must needs learn, for is there not a provision in the rules that no hostile meeting shall take place in consequence of anything said here? In a word, you should acquire something at least of the true spirit of scientific tolerance which seeks first the truth and is ready to prove all things, holding fast that which is good.

So much, then, for what your conferences here should teach you, and now a word as to the way in which they are conducted.

It is sometimes thought by those who are not members of the Royal Medical that our debates are carried on with an unnecessary degree of formality which was natural enough perhaps in the eighteenth-century atmosphere in which the Society was founded, but which is now somewhat archaic and out of keeping with the times, even if it does not amount to the assumption of what is vulgarly known as "side." I believe that such criticism is mistaken. A certain amount of dignity and formality in the conduct of its proceedings is, I feel sure, a useful antiseptic in any students' society, and for want of it I have known one make shipwreck and its meetings degenerate into a "rag." For the alternative to your own hierarchy of officers is to have one of your seniors in the chair and that I am sure is a mistake. Seniors are all very well in their proper place, but in a students' society they are apt to exert an inhibitory influence upon debate which is fatal to its freshness or spontaneity. For there should be nothing which will tend to restrain in any way the freest speculation at your meetings. Youth is a time when it is natural for the imagination to run riot, and it is well while you are still young to give it the rein freely. The time will come soon enough, when you have journeyed a little further from the East, when the load of facts will lie upon you with a weight as heavy as frost, and will effectually restrain you from any very soaring flights. For my own part I should not think, if you will allow me to say so, of taking too seriously anything that is said in this hall. Be as imaginative as you like, advance all sorts of wild hypotheses, play havoc with the facts to your heart's content, for these things are right and proper in a society of young men, and fortunately you publish no transactions. But if you had installed the Recording Angel in the chair in the shape of one of your teachers, how could the bright spirits among you let themselves go? A member would have one eye on the chair and the other on his pet theory, and would be apt to remain dumb lest what he said might be counted to him for unrighteousness in another place. Keep then your solemn state. Have your officers rising through the grades of secretaries, librarian, and presidents to the dizzy height of senior president, and have the chairman at your meetings placed in the lonely elevation of this chair, for your debates need not be dull because they are dignified, but lacking dignity they will largely fail in their purpose.

Compared with "conference" writing takes but a small place in the activities of this Society. There is, however, a salutary rule

that every member must in due time read a dissertation, as it is quaintly termed, before his fellows. This rule dates from a time when the "maintaining of a thesis" was an important step in taking a degree—even a pass degree—and the dissertation was perhaps designed by the founders of the Society to afford practice in that exercise. With the change in the character of examinations, however, the writing of a dissertation has become not less but, I think, more important. For it is a common, and to some extent a just, criticism of medical education to-day that it makes the student too receptive and insufficiently productive, that it puts information into him but does not ensure that it shall be digested. To this state of things dissertation-writing is to some degree a counteractive. It is good, if even only once in your student life, to be obliged to choose a subject for yourself, to think it out and to arrange your ideas about it clearly, and with the aid of your library to go to the original sources for your facts. You will no doubt be humiliated, unless you are a very conceited person indeed, to find how little you really know of your subject when you start to write about it, even though it be one of your own choosing, and as to which you thought you had some pertinent ideas in your head; but never mind, when you have at last, with pain and labour, produced your dissertation you will feel that on that subject at least you can lay claim to some exactness of knowledge. Nor should you be discouraged because you find you have nothing original to say. It is given to few, especially in their student days, to make original contribution to medical literature, and if all the others were deterred from writing how marasmic our journals would become! But in the temple of science are many mansions, and we have room not only for the original thinker, the *bahn-brechender* pioneer, but for the humble hodman of our art. We need to have the latest results of the laboratory brought down and their applications and implications pointed out, so that he who runs may read, and we need also to have the mass of facts which research is constantly accumulating classified, codified, and filtered, so that the new may be separated from the old, the grain from the dust, and the true from the false. We need also to have old truths constantly re-stated in the light of later knowledge, and above all we need criticism of new theories, remembering with Clough that—

> " Old things need not be therefore true,
>   O brother men, nor yet the new ;
>   Ah ! yet awhile the old thought retain,
>   And yet consider it again ! "

In one of these directions, then, you may make your dissertation a useful contribution to the work of the Society besides a valuable bit of training for yourself. It will serve, too, to awaken in you an aptitude and desire for independent thought and work, for it is interesting to note, when one turns back to the dissertations of past members of our Society who have afterwards distinguished themselves by their original contributions to science, how often the child has been the father of the man, and the subject which was first brought forward here has been the foundation of a great life work. For there is nothing more certain than this, that the boundaries of science are limitless, and any subject faithfully thought out and treated with the exactness of which Bacon speaks will not fail to be a starting-point from which endless vistas of inquiry will open out. Keep, then, to the rule of the compulsory dissertation; it may, perchance, frighten away some of the weaker brethren who would otherwise like to become members, but be assured that you will not lose through it any man who is worth his salt, and that it is a standing sign that membership of this ancient Society has its duties as well as its great privileges.

I have spoken, gentlemen, of the methods by which this Society can train its members in fulness, readiness, and exactitude of knowledge, and I must now refer briefly in closing to something even more precious that it can do for you. When you have gone out into your professional life, and the noise of your debates has died away, and you have forgotten, perchance, even the subject of your own dissertation, you will find, I do not doubt, that the most lasting gift the Society has conferred upon you are the friends you have made within its walls. It is a common reproach amongst the critics of our Scottish universities that the life of a student here is an isolated one, that he has too little opportunity of mixing with his fellows and rubbing off the angles of his idiosyncrasy. To some extent this criticism is just, but it is less just to-day than it has been at a previous stage of our history. The foundation of halls of residence, often started with little academic support, and the inauguration of the Students' Union have done much to remove this stigma from the fame of our University; but though it is good to share a common life with other students, and to mix freely in the Union with those of other aims and interests, it is good also in this Society to come into close contact with the men who are about to follow your own calling, to get to know those who will be your comrades in the fighting line, and who will bear with

you afterwards the burden and heat of the day in the constant battle with disease. This is an aspect of the Society's beneficence which must not be forgotten or under-estimated. It was present, doubtless, to the minds of its founders, for did it not start as a society of friends and come to life in a tavern? We cannot go back to those simple days, but it is right that you should carry on the tradition of an active social life; that you should breakfast together —how well I remember that breakfast!—after the annual inspection of the library, and that you should yearly entertain in this hall your teachers and representatives of the other learned professions. By so doing you maintain the dignity and prestige of the Society, you show that science and the humanities can walk hand in hand, and you are cementing those friendships which will last, I hope, as long as life itself, for they are built upon a foundation of good work done for the honour and well-being of this old Society, of which all Edinburgh men are so proud.

PRIMARY CANCER OF THE VERMIFORM APPENDIX.*

By JAMES M. GRAHAM, M.B., F.R.C.S.,

Senior Assistant to the Professor of Surgery, University of Edinburgh;
Assistant-Surgeon to the Deaconess Hospital.

ALTHOUGH primary cancer of the appendix is rare, the number of cases reported within the last decade shows that the condition is not so uncommon as was formerly thought. In most cases the tumours are discovered in appendices removed at operations. With few exceptions the tumours are small, and are only recognised on careful naked-eye or even on microscopical examination. There is no doubt that a neoplasm is entirely overlooked in many cases, as the character of the growth may be masked by inflammatory changes in the appendix.

The most striking figures available as to the frequency of the condition are those recorded by MacCarty and M'Grath,[1] who examined the material from the Mayo Clinic. Out of a total of five thousand appendices, primary cancer was found in 22 specimens, or in ·44 per cent. of the cases. In 1906 the subject was brought into prominence by Rolleston and Jones,[2] who collected forty-two cases of tumour of the appendix, of which thirty-seven were cancers. Since that time a relatively large number of cases have been recorded as a result of more careful examination of the specimens. There is now a considerable litera-

ture on the subject, and I have been able to collect details of 172 cases of primary cancer, excluding other tumours, such as endothelioma and sarcoma, which are much rarer.

Analysis of the literature shows that cancer of the appendix possesses certain peculiar features. Its distinctive characteristics are — (1) the benign nature of the growth; (2) the early age incidence; and (3) the type of cell, which is more commonly spheroidal than columnar.

In these particulars the condition contrasts very markedly with the columnar-cell cancer common in other parts of the large intestine.

Although there are no clinical symptoms by which cancer of the appendix can be diagnosed, it is important to study the morbid anatomy of the condition in order that its presence may be more readily recognised. With this object in view an examination was made during the last year of 400 appendices from the collections of Professor Thomson and Mr. Miles. As a result of this inquiry three cases of primary cancer were discovered, one during the routine examination of an appendix after operation, and two specimens, which had been removed at an earlier date, in which the presence of a tumour had been overlooked. This material was further increased by three specimens of the disease kindly lent for examination by Professor Caird, Mr. Cotterill, and Mr. Stiles.

Certain observers, such as Neugebauer,[3] classify the majority of appendix tumours as endotheliomata, partly on account of the type of cell and partly on account of the benign nature of the tumours. In the six cases recorded here there is sufficient evidence to show that the tumours are undoubtedly cancers, and it is probable that some of the tumours reported as endotheliomata belong to the same class. Before describing the details of the individual cases the main facts may be mentioned of the six cases which have been investigated—

1. All were obtained at operations, in four of the cases performed for symptoms of appendicitis.

2. The presence of a tumour was suspected in three cases at the operation; in the other cases it was found on longitudinal section of the organ.

3. The age in all the cases was under thirty.

4. The tumour was situated at or near the tip in four cases, in the middle third in two cases.

5. The tumours had a characteristic yellowish colour, and in all the cases the lumen was obliterated at the site of growth.

6. Signs of old appendicitis were found in every case at the site of growth.

7. Concretions were present in two cases and a whip-worm in one case.

8. Microscopically the tumours are chiefly spheroidal-cell cancers; in three cases they represent a transition between spheroidal-cell and adeno-carcinoma.

9. No enlarged glands or metastases were observed.

CASE I.—Mrs. D., æt. 27 : operation by Professor Thomson on 20th November 1911. History of two attacks of appendicitis. First attack eighteen months before operation. The appendix was found behind the cæcum embedded in firm adhesions. The patient was in good health one year after the operation.

Macroscopical Characters (Fig. 1).—The appendix was curved and kinked. The peritoneal coat was much thickened, and a round swelling, regarded as a concretion, was present in the middle third. On section of the appendix the swelling was found to be due to a tumour, which was pale yellow in colour. It was constricted in the middle, and completely obliterated the lumen of the appendix for 2 cm. The surface of the tumour was smooth, but a fibrous stroma was visible. The constricted appearance of the tumour suggested its origin at the site of a former stenosis of the lumen. Beyond the tumour the lumen was dilated, and the walls of the appendix were greatly thickened.

Microscopical Characters (Fig. 7).—The cells are small, round or slightly spindle-shaped, and are closely packed in alveoli. The nucleus stains darkly, and the protoplasm is scanty; there are no mitotic figures. There is a well-formed fibrous stroma. Although chiefly confined to the position of the mucous and submucous coats, the muscle and peritoneum are invaded at one point by groups of cancer cells. Sections at different levels fail to show any trace of the original lumen, but a few solitary tubules are scattered throughout the tumour. Fresh sections stained with Sudan iii. show the presence of a large amount of fat in the form of minute globules in the cancer cells, particularly in the larger cell masses. The muscular and peritoneal coats are greatly thickened and scarred, especially opposite the centre of the tumour.

CASE II.—There was no clinical history available of this case. The specimen was removed by Mr. Miles for symptoms of appendicitis.

Macroscopical Characters (Fig. 2).—As in the former case, the appendix is kinked towards its middle. The surface is roughened, and shows remains of adhesions and attached omentum. On longitudinal section a tumour was found in the middle third of the organ, extending for 1·5 cm., and completely occluding the lumen. The tumour is yellow in colour and smooth, with a trace of fibrous stroma ; it has an hour-glass shape,

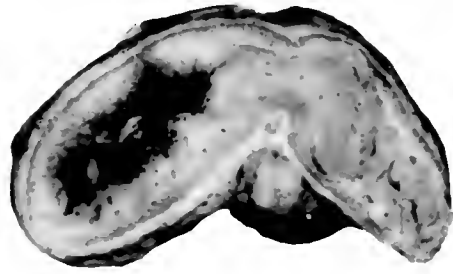Fig. 1.—Case I.

Fig. 2.—Case II.
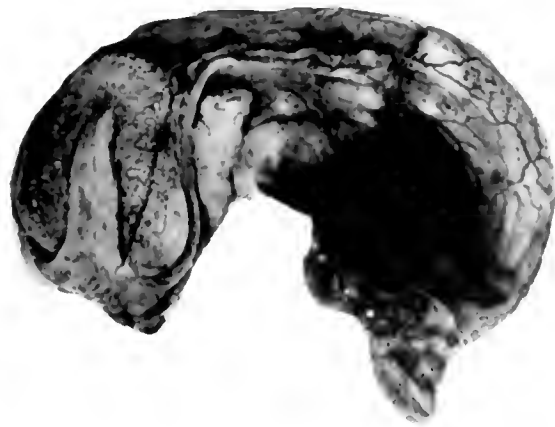
Fig. 3.—Case III.

Fig. 4.—Case IV.

Fig. 5.—Case V.

Fig. 6. Case VI.

Figs. 1 and 2. Cancer in middle third at site of former constriction. Fig. 3. Cancer proximal to constriction. Figs. 4, 5, 6. Cancer at tip.
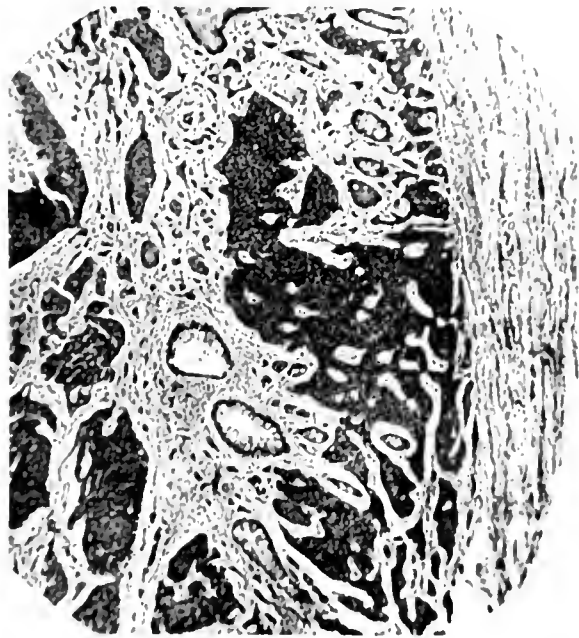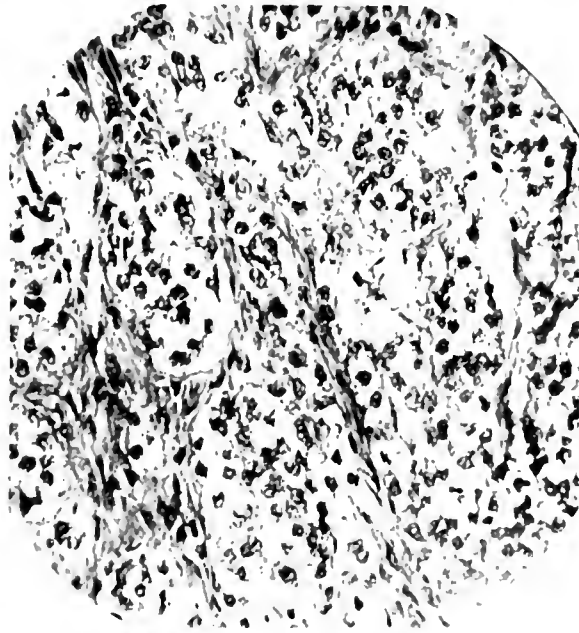
Fig. 9. Case IV.
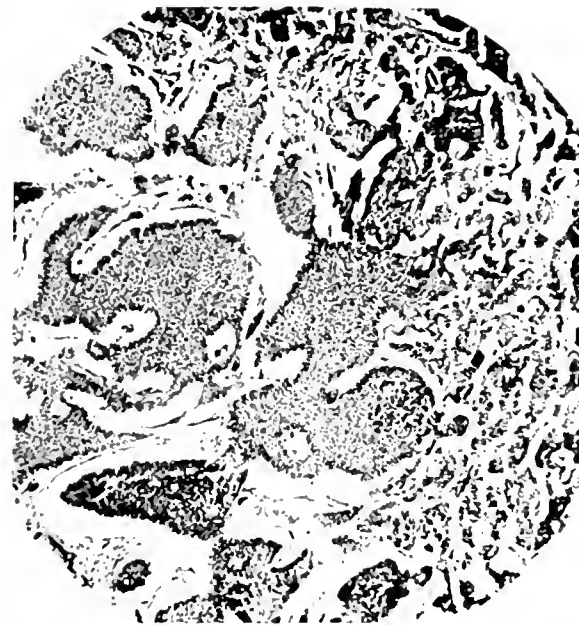
Fig. 12. Case VI.

Fig. 8. Case III.

Fig. 11.— Case V.

Fig. 7. Case I.

Fig. 10. Case V.

Fig. 7. Spheroidal-cell cancer. Fig. 8. Vacuolation of cancer cells. Fig. 9. Spheroidal-cell cancer, scirrhous in parts. Fig. 10. Cancer, transitional between spheroidal-cell and columnar epithelium. Fig. 11. Cancer invading mesenteric fat. Fig. 12. Transitional cancer, showing area of spheroidal cells, columnar epithelium and adenocarcinoma.
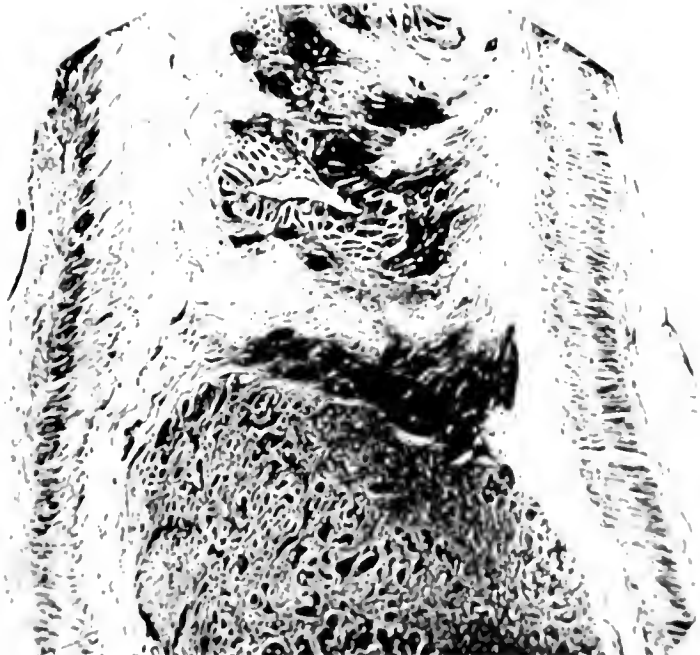
Fig. 15.

Fig. 17. Remains of tubules in process of obliterative appendicitis.

Fig. 14. — Case V.

Fig. 14. Cancer at tip with scar tissue from former obliterative appendicitis.

Fig. 13. — Case II.

the constricted part being opposite the kink of the appendix. Distal to the tumour the lumen is dilated, and contains several small concretions.

Microscopical Characters.—Histologically the appearances are very similar to those of Case I. Here and there the cells assume a duct-like arrangement, suggesting their glandular origin. A considerable number of the cells are vacuolated. Frozen sections show the presence of fat in the cells. Towards the distal end chains of cancer cells have invaded the lymphatics between the muscle bundles, and have reached the peritoneum. A few normal tubules and remains of lymphoid nodules are scattered throughout the tumour, but there is no sign of a lumen. Both ends of the tumour are separated from the lumen by a thick layer of well-formed fibrous tissue containing some lymphoid nodules, the remains of tubules, and of isolated portions of the lumen (Fig. 13). The appearance suggests the origin of the cancer in an obliterated portion of appendix, and this view is supported by the thickening and sclerosis of the muscular and peritoneal coats. Beyond the tumour the mucosa is intact, but the tubules are fewer in number and all the coats are thickened. In the lumen proximal to the tumour the presence of an intestinal parasite—the trichocephalus trichiurus—was detected.

CASE III.—Male, æt. 25 ; operation by Mr. Miles on 7th December 1902. Ten days before operation the patient complained of sudden severe pain in the right iliac fossa. At the operation the appendix was found acutely inflamed and fixed by dense adhesions to the anterior wall of the cæcum. The patient died three days later from septicæmia.

Macroscopical Characters (Fig. 3).—The whole appendix has been acutely inflamed and has a sloughy appearance. Longitudinal section discloses a concretion, firmly embedded at the distal end, with a small diverticulum reaching to the surface. Proximal to the concretion the lumen is completely obliterated by a tumour extending for 1·2 cm. in length. The tumour is pale yellow and has a trace of fibrous stroma. It is obvious that the tumour occupies the site of an old inflammatory area around the concretion.

Microscopical Characters.—Parts of the tumour resemble closely the two previous cases, being composed of alveoli, with small spheroidal cells and a stroma as in a scirrhous cancer, but the greater portion of the tumour is much more cellular. The individual cell masses are not very large, but the stroma is scanty. Another peculiar feature is the vacuolated and degenerated appearance of the cells, suggesting almost a colloid cancer ; but sections stained for mucin fail to show the reaction (Fig. 8). There are many fat globules in the degenerated cells. No lumen is present at any part of the tumour ; a few normal tubules remain towards one end. The ends of the tumour next the lumen are covered by a single layer of columnar epithelium. There is great

thickening of the submucous, muscular, and peritoneal coats, due to scar tissue. The muscular coat is invaded at one point.

CASE IV.—Female, æt. 22 : operation by Professor Caird on 24th March 1906. There was a history of two attacks of appendicitis, the first attack occurring two months before the operation. The end of the appendix was found to be enlarged, firm, and club-shaped. Tumour was suspected, and the specimen was injected with carmine before opening. The specimen is preserved in the Museum of the Royal College of Surgeons, Edinburgh.

Macroscopical Characters (Fig. 4).—The appendix is 7·5 cm. in length and appears slightly swollen throughout. There are no adhesions on the surface. On longitudinal section the tip is seen to be occupied by a tumour, which extends for 2 cm. in length and completely obliterates the lumen. In spite of the carmine injection the light yellow colour of the tumour is apparent. Towards the tip the muscular and peritoneal coats are thickened and fibrosed.

Microscopical Characters (Fig. 9).—The tumour lies chiefly internal to the muscular coats. Some parts are like a scirrhous cancer, but the main portion of the tumour is more cellular. The cells are round, small, but slightly larger than in the previous cases. Vacuolation is present in a few of the cells. At the margin of some of the cancer groups the cells are cubical. A few distinct duct-like formations are present where the cells are low columnar, and are arranged around a lumen. The muscular and peritoneal coats are invaded at one point. Signs of chronic lesions are not so marked as in the other cases at the site of tumour, but the coats of the appendix surrounding the tumour are much thickened, both from hypertrophy of the muscle and from connective-tissue overgrowth. The rest of the appendix shows infiltration of the mucosa, with loss of the epithelium at several places, indicating a recent inflammation. The end of the tumour next the lumen is covered by a single layer of columnar cells devoid of tubules.

CASE V.—Female, æt. 21 : operation by Mr. Cotterill on 2nd March 1909. The patient had complained of pelvic pain for fourteen days. There was free fluid in the pelvis, and the left tube and ovary were found inflamed and removed. In the region of the appendix there was some recent lymph, but the appendix was free from inflammation. A bulbous swelling was noticed at the tip, and the appendix was accordingly removed. The patient was in good health three years and eight months later.

Macroscopical Characters (Fig. 5).—The appendix is 4·2 cm. in length and ·6 cm. in diameter. The tip is hard and occupied by a tumour ·9 cm. long and 1 cm. broad. On section the tumour is yellow in colour and has a trace of fibrous stroma. All the coats towards the tip are replaced by the tumour, the peritoneal layer above being recognised.

There is no trace of lumen at any part of the tumour, and for 4 cm. proximal to the tumour the lumen is obliterated by fibrous tissue. The rest of the appendix shows no signs of former appendicitis.

Microscopical Characters.—The cells are mainly arranged as in a scirrhous cancer, with more cellular parts. The cells are round or slightly spindle-shaped, and are extremely small. A small area is present in which the cells have a distinctly acinous arrangement, enclosing a small lumen, the nuclei being peripheral (Fig. 10). Vacuolation is not marked, but frozen sections show that many of the cells contain fatty globules. Invasion of the coats has occurred, and groups of cancer cells can be seen in the fat of the mesentery (Fig. 11). The muscle in the region of the tumour is enormously thickened, distorted, and associated with a fibrous connective-tissue overgrowth. The small area in which the lumen is obliterated, proximal to the tumour, is composed of dense scar tissue.

CASE VI.—Male, æt. 29 ; operation by Mr. Stiles on 27th January 1911. For four years the patient had complained of sharp pain above the centre of Poupart's ligament on the right side. An X-ray photograph showed a shadow in the line of the ureter. At the operation calculus in the ureter was excluded ; the tip of the appendix was found to be bulbous and firm, and the appendix was accordingly removed. A few adhesions were present between the cæcum and the appendix. An X-ray photograph taken later proved that the shadow was still present, due, probably, to a phlebolith. One year and ten months after the operation the patient was in perfect health.

Macroscopical Characters (Fig. 6).—The appendix is 8·5 cm. in length and ·5 cm. in diameter. The tip is bulbous, but there is no inflammatory change on the surface. The cut surface of the tumour is homogeneous and yellowish in colour. There is no trace of lumen, and only the peritoneal coat can be recognised in the region of the tumour. Proximal to the tumour, and intervening between it and the lumen of the appendix, there is a considerable amount of fibrous tissue, which has obliterated the lumen at this point.

Microscopical Characters.—For the most part the tumour is like an encephaloid cancer, with scanty stroma and masses of spheroidal cells. Elsewhere there are areas like scirrhus where the stroma is more fibrous. Vacuolation is marked in many of the cells, and frozen sections show the presence of fat globules. In one part of the tumour there is distinct columnar epithelium and an area of tubular adeno-carcinoma ; transitions between the spheroidal and columnar cells can be traced (Fig. 12). The secreting character of the cells is further demonstrated by the presence of mucin in parts of the sections. Invasion of the muscular coat has commenced. Dense scar tissue intervenes between the lumen and the tumour. Traces of scar tissue were also found in the cancer area.

From the details of the individual cases it is obvious that the tumours described above belong to the same class. That the patients should in every case be under the age of thirty is in itself a striking fact. The naked-eye appearance of the tumours also shows a great similarity, both on account of the yellow colour and of the complete obliteration of the lumen by the tumour. The prevailing type of cell is spheroidal, but in Cases IV., V., and VI. there are areas in which the cancer is transitional, showing traces of adeno-carcinoma, and this makes the conclusion fairly certain that the tumours are derived from the glandular epithelium of the appendix. Further proof as to the origin of these tumours is supplied by the presence of columnar secreting epithelium in Case VI.

A feature of the cases is the vacuolation of the cells, which was present in more or less marked degree in all the cases except No. I.; this was at first regarded as additional proof of the secreting origin of the cells, but it is more likely that the vacuoles are due to a degenerative process. Frozen sections show the presence of many fat globules in the cancer cells, particularly where vacuolation is most marked. Even in the first case, where vacuolation is absent, the cells contain a considerable amount of fat. This detection of fat is important, as it offers the most likely explanation of the yellow colour common to all the tumours in my series.

Relation of the Cancers to Chronic Appendicitis and Obliteration. —As in most of the recorded cases the cancers completely obliterated the lumen of the appendix at the site of growth, thus presenting a marked difference from the cancers in other parts of the alimentary canal. One would expect in a cancer proliferating into the lumen that some trace of the lumen would be left. The mere fact that the appendix is a blind tube will scarcely explain the obliteration of the lumen by the growth. A more likely explanation is that the obliteration had been partial or complete before the start of the cancer. This view has been advanced by Letulle[4] and MacCarty and M'Grath.[1] The latter observers found cancer present in almost 2 per cent. of obliterated appendices. As the process of obliteration must be regarded as due to inflammation rather than to involution, this theory suggests a close relation between appendicitis and cancer. There is no doubt that a connection exists between the two. As a rule it is due to symptoms of appendicitis that cancer of the appendix has been discovered. In some cases the appendix has been acutely

inflamed, perforated, or gangrenous, and it is of course quite probable that in such cases the existence of the tumour has excited the inflammation. On the other hand, in the majority of the cases there is a protracted history of appendix trouble (three years in MacCarty and M'Grath's cases), and it is more than likely that the cancer has developed in appendices the seat of chronic lesions. Chronic lesions have been frequently described also in acute cases. The frequency of appendicitis in youth might explain the early age characteristic of appendix carcinoma.

In Cases I. and II. the cancer is at the site of a definite kink and stenosis of the appendix; in Case III. the tumour is immediately proximal to a large concretion, and the appendix was bound down by dense adhesions; in the remaining cases there is fibrosis and hypertrophy of the muscular coats adjacent to the tumour, whilst the rest of the appendix is more or less normal. These observations support the view that carcinoma is related to chronic lesions of the appendix.

There is also evidence that the cancer has originated in an obliterated portion of the appendix in Cases II., V., and VI., as there is scar tissue intervening between the tumour and the lumen (Figs. 13, 14). In the remaining three cases the signs of obliteration are not so definite. The ends of the tumours next the lumen are covered with a single layer of columnar epithelium similar to what is seen after repair of the mucosa; this appearance is common at the point of obliteration in obliterative appendicitis (MacCarty and M'Grath), and this fact, together with the chronic inflammatory changes observed in the wall of the appendix, makes it possible that in these cases also there may have been obliteration previous to the cancer.

Changes Observed in Obliterated Appendices. — As there is apparently a close relation between obliteration and cancer, an examination was made of forty appendices, in which there was partial or complete obliteration of the lumen, in order to ascertain whether any conditions were present which might predispose to cancer.

This investigation confirmed the view now commonly held that obliteration of the lumen is due to an inflammatory process. In the obliterated area the peritoneal coat is frequently thickened and fibrous, showing the remains of adhesions or of attached omentum on the surface; the muscular coats are generally hypertrophied and sometimes markedly sclerosed, occasionally, however, the muscle layers are normal or even thinner than normal. When

obliteration is complete the lumen is replaced by connective-tissue overgrowth from the submucosa, and in old-standing cases there is usually a marked increase of the submucous fat.

Occasionally the lumen is obliterated at several places, the intervening parts not being necessarily dilated. As a rule when the process occurs towards the centre of the organ there are signs of gradual stenosis, as shown by dilatation of the lumen beyond, and hypertrophy of the muscular coats. The tip of the appendix is more frequently involved than any other part.

Although obliteration of a portion of the lumen is apparently complete to the naked eye, in many cases the process is only partial; there may be a trace of lumen, very much contracted, often tortuous, and with the surfaces in contact passing through new-formed fibrous tissue. Occasionally a few tubules only are to be seen surrounded by a fibrous and thickened submucous coat (Fig. 15). Presumably, if the process advanced further, these tubules also would disappear. The lymphoid tissue in these cases was much reduced or absent. No constant change was observed in the epithelium during the process of obliteration. In some cases the cells are hypersecreting. Occasionally there is a simple hyperplasia, or the mucosa may be simpler than normal, composed of a single layer of cells, which may be cubical in places. Sometimes the epithelium is surprisingly normal.

The most important fact observed is the occasional presence of the remains of the lumen either in a very attenuated form or as isolated tubules. If cancer developed in such a situation it would be easy to understand obliteration of the lumen by the tumour. Letulle has recorded an early case in which cancer was beginning in the midst of scar tissue, which obliterated half the lumen of the appendix, the growth being partly cylindrical and partly spheroidal-cell cancer.

It seems justifiable to conclude that in a certain number of cases the irritation of isolated tubules or of mucosa undergoing the process of obliteration may act as the exciting cause of cancer. The presence of a few tubules and the remains of lymphoid nodules, as in Cases I., II., and III., suggest that the process of obliteration was incomplete when the cancer started. The effects of chronic lesions of the gall-bladder or stomach in producing cancer are well recognised, and the same influences are probably effective in appendix carcinoma.

Conclusions.—(1) That the cancers are derived from the glandular epithelium. (2) That the yellow colour is due to fat in the cells.

(3) That the tumours are associated with lesions of former appendicitis. (4) That in three, and possibly in all, of the cases there was previous obliteration of the lumen. (5) That in apparent complete obliteration due to inflammation, tubules or a trace of lumen are not uncommonly present. (6) That the chronic inflammatory lesions influence the malignant change.

Several important points have so far not been touched on in this paper, and a brief account will therefore be given of the main facts regarding the condition, which are available from an analysis of 172 cases, including my own series and those recorded in the literature. Cases in which there was any doubt as to the origin of the cancer in the appendix have been excluded.

Source of Material.—Only twenty of the 172 cases were discovered at post-mortem examinations. This is partly explained by the frequency with which associated symptoms of appendicitis call for operation, and partly by the small size of the tumours. Letulle, in 800 post-mortem examinations, discovered cancer of the appendix in 7 cases, so that the condition is probably frequently missed at autopsies.

Sex.—Out of 160 cases where the sex was mentioned, 95 were females and 65 males.

Age.—The average age ascertained in 152 cases is 30. Cases have been recorded at the extreme ages of 5 and 81. It is interesting to compare the age incidence in other parts of the large intestine. In 30 cases of cancer of the caecum collected by Rolleston and Sheild[5] the average age is 47·8, and in 100 cases of cancer of other parts of the large intestine, 49·34 years. A difference in the age incidence has been noted in the different forms of cancer of the appendix.

Concretions.—These were mentioned only in 9 cases; there is thus a marked difference from the conditions common in cancer of the gall-bladder.

Situation of the Tumours.—In 64·3 per cent. the growth is at or near the tip, in 10 per cent. at the base, in 19·3 per cent. in intermediate parts, and in 6·2 per cent. it is diffuse throughout the appendix.

Type of Cancer.—Cancer of the appendix falls into two main groups—spheroidal-cell cancer and adeno-carcinoma. The spheroidal-cell cancers have been described by different names, such as scirrhous cancer, medullary cancer, carcinoma simplex, alveolar cancer, basal-cell cancer, etc.; but the detailed descriptions indicate that the cases recorded under different names are practically

identical. This type occurs in 73·8 per cent. of the cases. The second type of cancer includes cases described as cylindrical-cell cancer, adeno-carcinoma or adeno-colloid. This group includes 18 per cent. of the cases. In addition 5·8 per cent. of the cases not included in the above group are recorded as transitional between spheroidal-cell and adeno-carcinoma; 2·3 per cent. of the cases are described as colloid cancers.

A comparison of the average age incidence in the different groups is instructive :—

Type.	Cases.	Average Age.
Spheroidal	127	27·2
Adeno-Carcinoma	31	39·5
Transitional	10	29·8
Colloid	4	44·7

In the case of the adeno-carcinomata and of the colloid cancers it will be seen that the average age is considerably greater than in the spheroidal cancers, and that it corresponds more closely to the age at which cancers of similar type occur in the large intestine. A further difference between the two types exists in regard to their malignancy, as was pointed out by Rolleston and Jones.

In only one case of the spheroidal-cell type, where the growth was undoubtedly primary in the appendix, was there invasion of the cæcum or spread by metastases to other parts ; the age of this case, recorded by Léjars,[6] was 27. In a few cases, as in Case V. of my own series, the cancer has reached the mesentery of the appendix without spreading further. Even including a few cases of doubtful primary origin, in which the cancer has been diffused, the percentage of malignancy remains extremely small in the spheroidal-cell cancers.

Out of 35 cases of adeno-carcinoma or colloid cancer, on the other hand, 6 cases are recorded by Beger,[7] White,[8] Voeckler,[9] Neugebauer,[3] Bertels,[10] and Marsh [11] in which the cancer has spread to the cæcum or by metastases to the abdominal glands or organs or other parts. The average age in these cases was 51·8.

Recognition of the difference between the degrees of malignancy of the two types is important, as the prognosis must be guarded when adeno-carcinoma or colloid cancer occurs, especially in middle-aged patients.

Relation of Cancer of Appendix to Cæcal Cancer.—The rarity of appendix carcinoma might be explained by its non-recognition due to involvement of the cæcum. It is improbable that this is commonly the case. MacCarty and M'Grath examined 20 cases of cæcal cancer from this point of view, and in only one case was

the origin in the appendix probable. In twelve cases which I have examined the cancer appeared to have started in the ileo-cæcal valve or in the wall of the cæcum: where the appendix was involved it was apparently secondary. Eight of these cases were adeno-carcinoma, 2 were colloid, and 2 spheroidal-cell cancers. It is obvious therefore that the common type of appendix cancer differs histologically from the usual form of cæcal cancer. The common situation of cancer of the appendix at or near the tip is also against the probability of frequent spread to the cæcum.

It is difficult to explain the benign nature of spheroidal-cell cancer of the appendix, as the tumours locally invade the coats of the appendix, and histologically are of a malignant type. According to Jamieson and Dobson[12] there is a free lymphatic communication between the various coats of the appendix. Appar-ently the spheroidal type of appendix carcinoma must be regarded as comparable to rodent cancer of the skin, possessing local signs of malignancy, but rarely giving rise to metastases.

Several observers have drawn attention to the resemblance between primary carcinoma of the ileum and spheroidal-cell cancer of the appendix. The histological appearances are very similar, and both are relatively benign. The former occurs, however, in patients at a much later age, usually in the fourth or fifth decade, and, unlike cancer of the appendix, primary carcinoma of the ileum does not seem to be associated with precedent chronic inflammatory changes.

In conclusion I have to express my gratitude to Professor Alexis Thomson and to Mr. Miles for placing the appendices in their collections at my disposal. I have also to thank Professor Caird, Mr. Cotterill, and Mr. Stiles for kindly allowing me to examine their cases. I am indebted to Mr. Frank Pettigrew, Technical Assistant, University Surgical Laboratory, for the photo-graphs of the specimens and for some of the micro-photographs.

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ON TUMOUR-FORMATION AND ALLIED PATHOLOGICAL PROCESSES.

By ARTHUR J. BROCK, M.D.,

Medical Officer, New Town Dispensary, Edinburgh ;
Hon. Sec., Edinburgh Medico-Sociological Club.

In a former paper[1] I have suggested that the view held by the modern "psychological" school of insanity regarding hysteria and its kindred neuroses—namely, that these result from a dissociation or splitting-up of the personality or ego—might conceivably be capable of extension also into the field of malignant disease, in which we find certain cells acting apparently in opposition to the normal bodily economy in a way which suggests the relaxation of some central controlling agency. In hysteria and cancer the constituent units (cells or mental faculties) dissociate themselves more or less completely from the general "ground-plan" of the mind or body, as the case may be, and pursue divisive and centrifugal courses.

I further suggested that the central co-ordinating principle, which in both of these cases appeared to be in abeyance, was a complex of impulses which may be roughly subsumed under the name of the "moral," "social," or "race-maintaining" instincts, and which Siegmund Freud and his followers have too narrowly envisaged as "sexual" in nature.

In the present paper I wish further to elaborate this conception as throwing light on the problem of tumour-formation. In its application to the psycho-neuroses this point of view stands in less need of advocacy ; apparently only time is needed to secure its general acceptance among medical psychologists.

In tumour-formation, then, it is probable that we have to deal essentially with a *lessening of central restraint* which permits certain cellular elements to grow and proliferate at the expense of their normal neighbours. There is in this a very interesting parallel to the condition of a society whose government or essential institutions have become inefficient, causing or allowing bodies of citizens to enter into a state of irresponsible isolation, if not of active rebellion, pursuing their own immediate ends without regard to the interests of the community as a whole. That this is the state of affairs in cancer has been pretty abundantly testified to by those who have studied the subject in its widest bearings ; the sociological parallels are particularly striking.

Sir William Collins,[2] writing almost a quarter of a century

ago, after voicing the now universally accepted view that in the cells of a malignant growth there is "a reversion to embryonal cell type," adds, "They [the cancer cells] lack *the influence which makes for organisation*, their instincts are of the lowest, are amœboid in fact. They possess the fecundity of cells unfitted for 'colonial' life, and share their vagabond propensities."

Alexander James[3] recognises in cytology an antithesis between reproduction on the one hand and growth and development on the other. What causes the characteristic reproductive activity in cancer is, he considers, a "failure of nutrition"; if this cause continues in operation it is evident, he says, that the resulting reproduction "will be the reproduction of organisms on cells less complex and less developed." He rejects Cohnheim's theory of cancer being an awakening into life of latent embryonic "rests," supposing rather that we have to do with some halting in the ordinary transition process (which goes on throughout life) "of simple cells into the various differentiated tissues, similar to what takes place in the embryo, only much more slowly. In this transition process there will be stages in which the tissues formed exactly resemble the embryonic ones. . . . Suppose that at one or other of these stages reproduction occurs at the expense of nutrition, we should have a mass of tissue more or less resembling the embryonic, *i.e.*, a tumour produced."

Sir Alfred Pearce Gould[4] recognises that "cancer is cell life that is disorderly, irregular, with a minimum of development, differentiation, and function." He speaks of the "imperfect co-operation of these cells with their neighbours," of "their selfish greed, which enables them to live when other cells are failing and perishing for lack of nourishment."

The late Sir Henry Butlin[5] saw clearly that what we mainly need is "an explanation of the reasons which lead the cancer cell to behave so differently from the cells from which it is derived." To him the explanation of its erratic and independent behaviour was "that it has been endowed with that wondrous gift which no man has seen and which no man can understand—the gift of life, and that, owing to that gift, it has become an independent creature, a new creation or living thing." The cancer cell appeared to him to differ altogether from an ordinary somatic cell, in that it could live when transplanted, while the other could not. The difference, however, is surely only relative, as the facts, *e.g.*, of skin-grafting can show. Sir Henry Butlin's standpoint regarding the specificity of the cancer cell appears to have been

too absolute. The cancer cell differs in degree only from the other cells of the host's body. It is lower in the scale of evolution than these : it is less socialised. While each of these is engaged in duly completing the ascent of its " genealogical tree " the cancer cell has halted at one of the lower stages of this ascent, and has there shown the reproductive proclivities which characterise that stage.

Wilfred Watkins-Pitchford, Government Pathologist in Natal,[6] likens the malignant cells to certain inhabitants of a city who have " forgotten their traditions of good behaviour," " the riot which ensues " therefrom being cancer. " Many," he adds, " will doubtless criticise the applicability of this fable on the ground that the behaviour of the cells of the body is not usually admitted to be controlled by any influence which may be reasonably compared with tradition. That there is, however, some such influence, and that it plays an all-important part in controlling the multiplication of animal cells and in maintaining their individuality, is becoming increasingly recognised of late years."

But the sociological analogy can be pressed further. An individual who, in a badly ordered state, had developed markedly revolutionary or anarchic principles would, if transferred to another and perfectly stable community, probably fail to settle down at once into the orderly life of his fellow-citizens, but would be very apt to foment strife in his new environment, even though the " social cohesion " there was of normal strength. (We may instance the Sicilian " Black Hand " in the United States.) This sociological principle transferred to the biological field seems to me to dispose of an objection made by E. F. Bashford[7] to the theory of the constitutional nature of cancer. His crucial argument is that cancer can be experimentally transferred from one mouse to another, the new growth so implanted showing all the phenomena characteristic of the natural disease. It is, however, easy to conceive how a cancer which, owing to a very great reduction in its host's resisting powers, had become particularly virulent, might, if transferred to a fresh soil with average resisting powers, yet manage, by virtue of the impetus already gained, to continue its independent and " selfish " career in the body of its new host. This would in no wise prove that cancer does not, under ordinary circumstances, arise endogenously or *de novo*.*

It is generally agreed that no hard-and-fast line can be drawn

* The same reasoning obviously applies to the ordinary *exogenous* parasites (bacteria, etc.) which excite infectious disease. The boundary-line between harmless saprophytes and pathogenic parasites is one which is constantly fluctuating and can never be fixed by any arbitrary standard.

between simple and malignant growths: the difference between them is one of degree. The cells of a simple tumour are, as regards the body, relatively less parasitic and more symbiotic than those of a malignant tumour, and *vice versâ* [8], [9]. We know how, under certain conditions—to quote the words of Watkins-Pitchford —"the chondroma becomes a sarcoma, the adenoma 'degenerates' into the glandular carcinoma, the benign polyp, or simple ulcer, begins to infiltrate around the margins of its base, and a wart, which is so trivial a trouble upon the hand of a child, becomes upon the face of the aged a squamous carcinoma."

Short of actual tumour-formation there are various hyperplasias which at certain times of life seem to be almost normal, though they easily pass over into the pathological. During the period of childhood and early adolescence—before the organism has attained to the full stability of manhood—there is, as is well known, a tendency towards various minor psycho-neuroses, and it may be that certain simple tissue-overgrowths characteristic of this period, such as, *e.g.*, warts and adenoids, are to be looked on as expressions of the same functional instability; these form, so to speak, the connecting link between normally developing tissues and new growths. Tumour-formation is in one sense only ordinary cell development running to extremes—"getting out of hand." There is little or nothing histologically peculiar about a tumour cell; its *behaviour* is what essentially distinguishes it. (Thus, for instance, the process taking place in deciduoma malignum differs only in its range of activity from the ordinary phagocytic action characteristic of the chorionic villi at the time when they are attaching themselves to decidua in the young placenta.)

The principle of a withdrawal or slackening of control as affording an explanation of abnormal cellular proliferation in the fixed tissues is also quite clearly recognisable in relation to certain diseases of the blood, notably, for instance, in leukaemia, where we have an invasion of the whole organism by enormous numbers of embryonic white blood corpuscles. The analogy between this condition and tumour-formation is well brought out by Gulland and Goodall in their recently-published monograph on the blood.[10] They there say regarding lymphatic leukaemia: "It seems probable that the disease is caused primarily by some disturbance in metabolism of such a kind that the growth of lymphocytes is either encouraged *or perhaps, more probably, is not restrained as it is in the normal organism.*" [*] In reference to the less acute "myelo-

Italics mine.

cythæmic" form of the disease the same authorities state: "For very much the same reasons as those given in connection with lymphatic leukæmia we regard myelocythæmia as a useless over-growth of marrow cells, possibly due to the disturbance of *the mechanism governing cell production*—something akin to sarcomatosis. . . . As the elements involved are mainly granular cells in myelocythæmia, and as these are more highly differentiated than the lymphocytes, the disease is less malignant, and therefore in the great majority of cases runs a more chronic course than lymphatic leukæmia."

Now, it will be asked, what, more exactly, is this agency which under ordinary circumstances is at work in the body, and in whose absence the cells get "out of control"?

It may be at once said that as yet no verbal definition has been offered which has met, or is likely to meet with universal acceptance.

Two of our foremost biologists, Professors Geddes and Thomson, write as follows [11]:—"Despite the fact that as yet no vitalist writer has succeeded in making himself and his nomenclature really intelligible to any other, and that the frequent gibes at vitalistic metaphysics and mysticism remain largely justified, we confess that the modern movement of vitalism has our increasing sympathy. It affects our evolutionism to this extent at least, that we feel compelled to recognise the persistence of some originative impetus within the organism which expresses itself in variation and mutation and in all kinds of creative effort and endeavour."

One main reason why physiologists have hesitated to accept the idea of any "psychic" principle as being at work in, say, the developing ovum, is that they suppose such could not exist in the absence of a nervous system. But, as Richard Semon [12] says, "In animals, during the course of history, one set of organs has, so to speak, specialised itself for the reception and transmission of stimuli—the nervous system. But from this specialisation we are not justified in ascribing to the nervous system any monopoly of the function." "Plants," says Professor Marcus Hartog,[13] "are able to do many things that can only be accounted for by ascribing to them a 'psyche,' and these co-ordinated enough to satisfy their needs; and yet they possess no central organ comparable to the brain, no highly specialised system for intercommunication like our nerve trunks and fibres."

In the history of life we seem to see the pressing forward of some agency (an "originative impulse," an *élan vital*) to constantly

fuller degrees of self-expression. This exists more or less unconsciously in the lower animals, which follow it by "instinct," and thereby incidentally retain their health. In man for the first time this principle becomes self-conscious. We are aware of it in ourselves as the desire or striving for self-realisation, an impulse whose significance lies in the fact that, when followed by the individual, it has racial value. In the animals and in primitive man this impulse commands a much more consistent and implicit obedience than it does among the members of our modern civilised societies. The relative demission of this function by any organism results in a corresponding degradation in its mental or physical textures, or in both. This I take to be the essential *rationale* or inner meaning of the cancerous process, and to a lesser degree of tumour-formation in general.

There is, without doubt, an increasing "restlessness" apparent in the life of modern society; a larger proportion of our people are devoid of the sense of an "aim in life" than was the case in this country under the quieter conditions which reigned a few generations ago, and than is at the present day the case among the more settled communities of primitive peoples who are as yet practically untouched by industrial civilisation. If a man consciously persists in neglecting the impulses which call him to all-round self-development he tends to "break up" in various ways, and cancer, I would submit, is one of the ways in which he may "break up."

But of course it must not be supposed that every individual is to be held as "personally" responsible for the disintegration of his tissues. Though there is in many cases a large element of blame (as when cancer occurs in people who habitually over-indulge themselves, or in those who, through some perverse idea of duty, wilfully keep their individual potentialities dwarfed or stunted), still, of course, the hereditary element is often very decisive in the matter. If a man be not himself "to blame," very often his immediate family predecessors are. "The fathers have eaten sour grapes, and the children's teeth are set on edge." Such a theory, of course, involves acceptance of the possibility of acquired characters being inherited. Although this has seemed theoretically impossible, empirical observation has apparently confirmed it as a fact. The "Mneme" theory promulgated in recent times by Richard Semon,[14] which is, after all, little more than a re-statement in modern scientific dress of the views put forward over thirty years ago by Samuel Butler,[15] is one of the most promising attempts

that have yet been made to construct a "working thought model" of these elusive processes.*

But even a bad heredity, like a bad environment, must not be looked on too fatalistically. In the words of Björnson, "Heredity is a condition, not a destiny." It is at present impossible to set limits to what the individual, when once his energies have been properly directed, may do to atone not only for the "sins of commission and omission" of his own past life, but even for those, if we may so say. of his ancestral life—that which he passed "in the persons of his forefathers."

The upshot of my contention is that the modern spread, not only of functional nervous disease but also of many devastating organic maladies such as cancer, will ultimately be stemmed by a determined and well-thought-out "return to Nature" on the part of contemporary civilised society. The characteristic of the man or animal in the "natural" state is all-round development; this it is which is essentially awanting in the modern individual. Needless to say, however, the movement which is so much needed is no mere retrogression in a circle—back to the place from which we started. We must move round again to the outlook of the more natural man, *but on a higher turn of the spiral.* We will take our " civilisation " with us, but in future we will master it, not, as we have recently done, allow it to master us.

The physician of the future will tend increasingly to become an educator, an instructor in the " art of living " (that is, in true prophylaxis). He will have the width of outlook necessary to enable him to co-ordinate the various specialist points of view, whose independent and unorganised development at the present time is becoming something of a menace to the progress of the healing art.

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INCONTINENCE OF URINE IN CHILDREN.

By J. W. SIMPSON, M.D., F.R.C.P.,
Extra-Physician, Royal Hospital for Sick Children.

DURING the last eight years I have had the opportunity in the Out-Patient Department of the Sick Children's Hospital of seeing and treating many cases of children suffering from incontinence of urine. The following remarks, therefore, as to the causes and treatment of this condition are based upon experience derived from a study of these cases.

First of all it may be useful to answer the question: When does incontinence admittedly exist in the case of a child? In the matter of control of the evacuations of the bladder much may be accomplished, even in the first year of life, by the inculcation of regular habits. In ordinary healthy children this control ought certainly to be acquired by the end of the second year. If, however, by the end of the third year a child has not acquired this control, incontinence may fairly be said to exist. Of course, even in a normal child, lapses in this respect, due to some slight illness, may occasionally occur, but such cases, temporary in their character, ought not to be regarded as subjects of this troublesome and irritating condition. In the great majority of cases the incontinence only occurs at night; yet in such children control during the day, while not altogether wanting, is usually less firmly established than in normal children. Comparatively speaking, only a small proportion of children suffer from incontinence during the day, and a still smaller number during both day and night.

When a case of enuresis presents itself the first thing to be done is by examination to classify the case either as one of simple incontinence—that is, one without any definite pathological cause— or an incontinence of a graver character due to some well-marked pathological condition.

For this purpose of classification there are two leading questions that should be asked. The first is: Has the child *always* suffered

from incontinence, or has it at some earlier period been able to control the evacuations of the bladder? If the answer were that the child has always had incontinence, the case *might* be a simple one, but it would at least put the doctor on his guard to examine carefully for any congenital deformities, and, if need be, to go into the *mental* state of the patient.

There are a number of congenital malformations that may give rise to enuresis, but there are only two conditions that are likely to lead to mistakes in diagnosis, viz., an epispadias in a female, and a congenital deficiency between the bladder and vagina. I have seen two such cases of persistent incontinence in which the real cause of the condition, a congenital defect, had been overlooked. If there are no congenital defects to account for persistent incontinence, the mental state of the patient may be at fault. No well-marked case of idiocy could probably be overlooked, but a number of children suffer from an extremely slow development of the mental faculties and belong to the class generally known as "backward." In such children incontinence is almost to be expected, and improvement in this matter would naturally proceed contemporaneously with improvement of the whole mental state. The second leading question is: Is there any pain during micturition? If the answer is Yes, the case may in all probability be a simple enuresis due to well-marked hyperacidity of the urine, but the answer would also lead one to think of other possibilities, such as stone in the bladder, narrow meatus, with frequently a small ulcer at margin, phimosis, with some inflammatory skin condition superadded, or, a very rare condition, tuberculosis of the bladder. New growths of the bladder and acute cystitis would also cause painful micturition, but other more noticeable symptoms and signs would at once differentiate these from simple cases of incontinence. If stone be present, the enuresis usually occurs during the day when exercise is being taken, pain is usually felt apart from micturition, and a small amount of pus is nearly always present in the urine. A bimanual examination (with one finger in the rectum) would probably finally decide the matter, as the stone is easily felt on adopting this method.

A too narrow meatus with an ulcer, or a phimosis with inflammation, is more likely to give rise simply to dysuria, but it may lead to, or at least prolong, a condition of incontinence. In all such cases surgical treatment would have to be resorted to as a first step toward cure of the incontinence.

Tuberculosis of the bladder frequently begins with incontinence

without pain, but at a later stage pain is nearly always present. This condition usually occurs in older children. If in an older child there was persistent incontinence, which did not respond to treatment, one would think of the possibility of tuberculosis and have the urine examined for tubercle bacilli.

There are also certain conditions causing reflex irritation which, while not actually producing incontinence, may very considerably prolong its duration. Thus phimosis, vulvitis, thread worms, and anal fissure may be named as contributory causes, but in my experience the curing of these complications does not of itself cure the incontinence. These subsidiary causes should of course first be attended to before further treatment is undertaken. As an exception to this, however, I may state that I have found the removal of adenoids, without any further treatment, to be sufficient in some cases to effect a cure. Still it is only rarely that attention to subsidiary conditions will completely cure incontinence, and in the large majority of cases a regular course of treatment, such as outlined below, must be followed for some fairly prolonged period to give any chance of achieving successful results.

General Treatment of Simple Incontinence.—Children suffering from incontinence are frequently highly strung, and often not in a very good general state of health; it is therefore wise, if possible, to vary the surroundings of the patient. A change of air and scene is very beneficial in many cases. It is also noticed that the incontinence is usually specially evident during the first two or three hours of sleep; it is accordingly necessary to see that the child passes water immediately before going to bed. In two hours afterwards the child should be roused from sleep and the bladder again evacuated. This is especially important where the urine is alkaline. It is also important to try and establish as far as possible regular habits of urination throughout the day, and the child should be encouraged to retain the urine as long as possible, even at the risk of some slight discomfort. The amount of fluid taken should not be restricted during the day, but the last meal and fluid should be taken at least one hour before going to bed. Tea and coffee should never be given. A common treatment is to tilt up at the foot the bed of the patient, or to place something on the child's back to make lying on the side inevitable, with the idea of keeping the urine away from the most sensitive part of the bladder. Personally, I have never been able to convince myself that this procedure is of the slightest use. Lastly, plenty of fresh

air and a fair amount of exercise will prove important elements in effecting a cure. With this general treatment should proceed contemporaneously drug treatment.

Drug Treatment.—This must usually be of a rather prolonged nature, averaging from three to six months of systematic attention. Unfortunately incontinence in children has generally become more or less a habit before it is regarded in any serious way, and considerable time under new conditions must therefore be allowed so as to break this acquired tendency; besides, while drug treatment in some cases is successful in a short time, relapses are likely, or at least liable, to recur unless the treatment be sustained and regular. Thursfield, in an article in the *British Medical Journal*, some time ago expressed his belief in the efficacy of three drugs for the treatment of incontinence— belladonna, citrate of potash, and urotropin—and my own experience certainly coincides very largely with his. In order to use those drugs intelligently, however, one must first of all carefully examine the urine, as its composition determines the particular drug to be chosen. For the purposes of treatment the composition of the urine may be divided into the following groups :—

1. In some cases the urine presents no abnormal features. This "normal" condition is often seen in a case of incontinence following some debilitating illness which has reduced the strength of the patient.
2. The urine is found extremely acid, loaded with urates, of high specific gravity, and often diminished in quantity.
3. The urine is found to be neutral or alkaline, usually of low specific gravity, often containing triple phosphates, sometimes also a few pus cells with a trace of albumen, frequently much increased in quantity.
4. Urine may contain bacilli.

In the first group (normal urine cases) the treatment consists in giving a tonic to try and improve the general condition of the child. When this has been improved the administration of belladonna should be begun. In giving belladonna I usually begin with 10 minims of the tincture two or three times a day, and gradually increase the doses up to 20 to 25 minims. I have never given larger doses of belladonna, but I have used approximately larger doses of atropin. Even with the smaller doses of belladonna the child may complain of difficulty in seeing, dry mouth, etc., and when such is the case one must proceed carefully

before increasing the dose. I have, however, never had very much trouble in using belladonna, but once or twice with atropin I have seen well-marked symptoms of poisoning. With the great majority of patients one does not need to prescribe beyond 15 minims thrice daily, but it is advisable to continue this for a considerable period.

2nd Group—(Urine extremely acid, etc.).—Here one must first reduce the acidity of the urine, and this is most easily accomplished by the use of citrate of potash in doses of 10 grains thrice daily; even larger doses may be required. When the acidity has been reduced, the belladonna should be begun. If the child's general health is not very good, 2 or 3 minims of liquor strychninae added to the prescription is often beneficial. It is inadvisable to give meat when the child is suffering from this "acid" condition.

3rd Group—(Alkaline urine, etc.).—In these cases dieting is of the first importance. all carbohydrate food as far as possible being prohibited. If the urine is very alkaline, acid sodium phosphate may be given; when the alkalinity of the urine has been reduced belladonna should be used in the manner stated above.

4th Group—(Bacilli in urine).—A pure culture of B. coli is frequently obtained in such cases. If the urine is very acid it is wise at first to reduce the acidity by giving citrate of potash. then urotropin in 5 to 10-grain doses thrice daily often proves of immediate benefit. If there is mixed infection salol is often more efficacious. Mixed infection cases are often very troublesome. however, and a vaccine may sometimes be used with great advantage.

In the treatment of enuresis I have tried a large number of other drugs, such as ergot, antipyrin, suprarenal extract, thyroid, etc., but I have rarely seen any good results follow after belladonna has been used unsuccessfully. Ergot, however, ought to be tried if belladonna fails. I have used thyroid frequently, but the results obtained have been disappointing. It ought, however, always to be tried in those cases in which the child is markedly backward mentally. I have never felt warranted in using the huge doses sometimes recommended (15 grains in the day), my maximum dose being 5 grains daily.

If the child is highly nervous and suffers from disturbed sleep, night terrors, etc., the addition of 5 to 10 grains potassium bromide given with the last dose at night of belladonna often does good.

It is claimed by some observers that hypnotism, suggestion hydrotherapy, epidural injections, and lumbar puncture have all

been found beneficial in certain cases. The two last, especially, of these suggested remedies appear to me to be too drastic treatment for such a comparatively simple condition as enuresis, and should certainly only be resorted to in very extreme cases.

CLINICAL RECORD.

CANCER OF THE NASO-PHARYNX.

By T. J. THYNE, M.B., F.R.C.P., and J. S. FRASER, M.B., F.R.C.S.

MALIGNANT disease of the naso-pharynx presents a well-marked clinical picture, which, if recognised, should lead to a diagnosis that can be confirmed by inspection or digital examination of the naso-pharynx. In some cases it is by no means an easy matter to get a piece of growth for microscopic examination.

Mrs. W., aged 55 years, was seen in April 1912. She complained of gradual failure of health for more than a year, and of enlargement of the glands on the left side of the neck. She also stated that she had pain in the left side of the tongue, which was made worse by taking mustard or pepper. This pain shot up to the left ear. The patient had also noted that she hawked into her mouth small masses of mucus tinged with blood, and that she had a " closed-up " feeling in the left ear and was slightly deaf in it. Her voice was hoarse if she was tired and worried.

On examination the patient looked pale and feeble. The mucous membrane of the pharynx, when first seen, was covered with fluid secretion : this was, however, removed on gargling, and the patient hawked into her mouth a little muco-pus tinged with blood. There-after the mucosa of the pharynx was seen to be dry and atrophic. The tongue appeared normal. Anterior rhinoscopy showed that the nasal mucous membrane was pale and collapsed, and that the nasal cavities were roomy (this, no doubt, accounted for the atrophic con-dition of the pharynx). It was possible to see right through the nose into the naso-pharynx, but no growth or bleeding surface was visible in this way. Posterior rhinoscopy was impossible without the use of cocaine, which was not thought advisable. Both tympanic membranes were indrawn—the left one especially—and examination with the tuning-forks showed middle ear deafness, most marked on the left side. Indirect laryngoscopy revealed mucus in the larynx, but after coughing and clearing the throat the vocal cords were seen to be normal in appearance and movement, and the voice became clear.

The symptom-complex presented by the patient was very typical, viz., pain in the left side of the throat, shooting up to the left ear, hawking of blood-stained mucus from the back of the nose, and

Eustachian obstruction on the left side. In addition to this, enlarged glands could be felt on the left side of the neck beneath the sterno-mastoid, and in the posterior triangle. Digital examination of the naso-pharynx revealed a hard, rough surface, apparently about the size of a sixpence, on the posterior surface of the soft palate on the left side, extending towards the pharyngeal orifice of the left Eustachian tube. The tissues around felt somewhat infiltrated.

The case was diagnosed as one of malignant disease of the naso-pharynx (probably epithelioma), with secondary involvement of the cervical lymphatic glands. This diagnosis was confirmed by subsequent removal and microscopic examination of one or two of the enlarged glands.

November 1912.—The left side of the soft palate is now infiltrated, and the movements of the soft palate are impaired.

REFERENCES.—Citelli (*Zeitschr. für Laryngol.*, Bd. iv. Heft 3) gives an account of ten cases of primary malignant tumour of the naso-pharynx. Law, *Journ. of Laryngol.*, 1910, p. 141, and 1911, p. 196. Tilley, *Journ. of Laryngol.*, 1910, p. 142. Dupond, *Revue Hebd. de Laryngol., etc.*, 2nd January 1909. Milligan, *Journ. of Laryngol.*, 1910, p. 209. Guthrie, *Ibid.*, 1911, p. 449. Jackson, *Journ. Amer. Med. Assoc.*, 1901, p. 371. Elder, *New York Med. Journ.*, March 1901. Laval, *Arch. Internat. de Laryngol.*, 1905, p. 95. Compaired, *Ibid.*, 1907, p. 201. Trotter (*Journ. of Laryngol.*, 1911, p. 197) gives an account of the anatomy of the parts involved and the operative methods used in removal of the disease.

MEETINGS OF SOCIETIES.

Edinburgh Obstetrical Society.

At the first meeting of the session, held on 13th November, the President, Dr J. Haig Ferguson, delivered his presidential address on "Some Twentieth Century Problems in Relation to Marriage and Childbirth," in which reference was made to the maternity clauses of the National Insurance Act and the adverse influence it is likely to have on obstetrical teaching, the causes of the diminishing birth-rate, the persistence of a high mortality from puerperal sepsis in general practice, and the increased frequency of eclampsia.

THE second meeting was held on 11th December, Dr. Haig Ferguson, President, in the chair.

Sir Halliday Croom communicated a paper on "*Pseudo-eclampsia*," illustrated by a case which had been sent into his charge at the hospital as eclampsia. The patient, who was a secundipara and seven months advanced in pregnancy, had had fits of a severe character for two days, with very marked coma. As there were no abnormal constituents in the urine the toxæmia of pregnancy was eliminated, and there being no indications of eye reflexes or paralysis of any nervous lesion the diagnosis was rendered extremely difficult. The patient died, and as a result of the autopsy it was found that there was a tumour of the size of a tangerine orange lying within half an inch of the anterior end of the left hemisphere, and opposite the superior, middle, and inferior frontal convolutions of the convex surface of the hemisphere, and

opposite those parts of the marginal and callosal convolutions which lie above the anterior half of the corpus callosum. The tumour consisted largely of layer upon layer of flattened, dead epithelial cells. Between these were to be found, in the fresh condition, crystals of cholesterin. Essentially the tumour consisted of cholesterin with a supporting stroma of connective tissue upon which it lay. The tumour was therefore a cholesteatoma. The author afterwards commented on the comparative rarity of the tumour and its long quiescence in that situation. He described a further case of meningitis which had given rise to pseudo-eclampsia as well, thereafter giving a précis of similar cases that had occurred in literature, and discussing the cases in which there was a difficulty in the differential diagnosis of eclampsia.

Dr. George R. Livingston, Dumfries, communicated "*Short Notes on Five Patients who Suffered from Eclampsia.*"

CASE I. had had three fits before Dr. Livingston arrived to attend her in her 6th labour, and was unconscious, with stertorous breathing. Another typical eclamptic seizure coming on, ½ gr. morph. sulph. was given hypodermically, rendering the patient absolutely quiet within 30 seconds. The os being found fully dilated and head well down the membranes were ruptured and the child born in 5 to 10 minutes. The child's heart was beating very feebly and irregularly, and it made no effort at respiration, but after about a quarter of an hour's artificial respiration its condition became satisfactory, and attention was given to the mother, who had been lying in a semi-comatose condition. The uterus was firmly contracted, and the placenta was easily expressed. Her condition gradually improved, but two hours later she was again seized with a violent convulsion, and another ¼ gr. morph. sulph. was promptly administered. She lay quiet and deeply comatose for about 2 hours, and could not be roused; was stupid for some days, and did not regain her usual mental condition for a week or more, but eventually made a good recovery.

CASE II. was a multipara with a history of previous easy, uncomplicated labours, and when first seen was well advanced in labour and having strong, continuous pains, when she was suddenly seized with a bad convulsion, leaving her in a state of deep stupor, with stertorous breathing. The child was born naturally immediately afterwards, a second fit occurring just before the head was born, and whilst the doctor was in the act of injecting morph. sulph. ¼ gr. hypodermically. No more fits occurred; the stupor continued, and was followed by mental derangement for some days. The child gave no trouble, and the mother made a good recovery. Albumen was present in the urine during the puerperium.

CASE III.—Within two weeks of the calculated termination of her third pregnancy the patient, whilst sitting, was seized with a fit which lasted a few minutes. This was succeeded by a state of excitement, resembling insanity, in which she conceived a violent prejudice against her husband. There were no uterine contractions and no dilatation of the os. Urine had been passed involuntarily, and a specimen could not be obtained. She was not a likely subject of hysteria. A sharp purge was administered, and chloral and bromide prescribed to be given every 2 hours. The urine, when obtained, was found to become almost solid on boiling. Temporary improvement was followed late in the same evening by a typical fit, which was immediately arrested by a hypodermic of morph. sulph. ¼ gr. Shortly afterwards labour was found to have set in and advanced rapidly, and a healthy child was born naturally.

The patient was semi-comatose for about 24 hours, and for some days was mentally sluggish, and still had delusions about her husband. These, however, eventually passed off, as did also the albuminuria.

CASE IV.—In her first pregnancy the patient had a miscarriage at about the fourth month, and had apparently had a fit at that time. Dr. Livingston saw her first about the 6th month of her 2nd pregnancy, when she had the history and appearance of having had an eclamptic fit. Urine obtained later was scanty and very albuminous. A sharp purge and a chloral and bromide mixture were prescribed. In the evening she was dull and drowsy. Morph. sulph., ¼ gr., was given, and 5 or 6 hours later fits recommenced, increasing rapidly in frequency and severity. On the doctor's arrival he found that a six-months' foetus had been born, along with the placenta and membranes. Patient was quite unconscious, face and neck cyanosed, and breathing stertorous. This condition slowly passed off in the next few hours, and she made a slow but good recovery.

Dr. Livingston was again called to attend her in her 3rd pregnancy 3½ years later, when she was about 7½ months. She was heavy and drowsy, and during examination she took a fit. A soap and water enema and a hypodermic of morph. sulph., ¼ gr., were at once given. After free movement of the bowels a large saline injection was given per rectum. For about 6 hours patient slept heavily, then fits recommenced and became constant. Labour had set in and terminated a few minutes after the doctor's arrival, the foetus being dead. Just before labour set in morph. sulph., ¼ gr., had been given. Patient was deeply comatose after labour, and her general condition was very critical. Another copious saline injection was given. She remained unconscious all day, and in the evening had respirations 40 and pulse 140, weak and thready, and had all the appearances of dying. Two hours later, and 24 hours after the first fit, she had another severe and prolonged seizure, during which blood welled from her mouth, apparently from rupture of a blood-vessel in the lung. Another ¼ gr. of morphia was given, and she lay unconscious all night, but improved towards morning, and from then improvement was gradual but steady.

Thirteen months later she was again pregnant, and Dr. Livingston resolved to try her on thyroid extract, and prescribed the tabloids of the extract, three per diem, which was later increased to six per diem. She was put on milk diet and the bowels regulated. She kept remarkably well till within 2 weeks of her expected time, and then headache, depression, and some albuminuria appeared suddenly, and shortly afterwards fits supervened. In Dr. Livingston's absence his assistant controlled these for an hour or two by chloroform, at the end of which time a child was born which died within an hour. The mother remained deeply comatose, and despite every effort at resuscitation her heart failed rapidly and she died a few hours later.

CASE V.—When seen by Dr. Livingston, this patient, a primipara over 30, had been having fits at term for which his assistant had already had her purged freely, given saline in large quantity, and administered two hypodermics of ¼ gr. morph. sulph. Fits, however, had persisted; she was deeply comatose, and there were no signs of labour. The mother was apparently at the point of death, the passages were small and the cervix closed, so Dr. Livingston determined to follow the course advocated by Sir Halliday Croom in such cases and perform Cæsarean section in the interests of the child.

This he performed successfully after the patient had been removed to the Dumfries and Galloway Royal Infirmary. A healthy child was born, and the mother eventually made a good recovery, although for about 3 or 4 weeks her mental condition remained peculiar.

Both communications gave rise to interesting discussions.

Forfarshire Medical Association.

THIS association held a meeting in Dundee on 5th December, Dr. J. S. Y. Rogers acting as chairman.

Dr. Rogers showed a girl (aet. 6) who had been on several occasions a patient in the Royal Infirmary. The case presented *fissuring of the tongue* which he regarded as due to severe ulceration, and also a skin eruption, for which Dr. Rogers suggested the diagnosis of prurigo gravis.

Dr. Pirie exhibited photographs and radiograms from recent cases. These were chiefly from cases of diseases of stomach and intestine and of the knee-joint.

Dr. A. E. Kidd read a paper entitled "*Two Years among School Children*," and with a wealth of figures described the work that had been done by himself and his staff in the Dundee schools. Many of his figures were in accordance with what was found in other parts of the country. However, in the case of rickets the total percentage of cases was 4·7, the boys showing 6·9 per cent. and the girls 2·4 per cent. This disparity in the sexes was anomalous, and these figures, which were obtained at the end of the first year, were exactly the same as those that were arrived at by the examination of the second year, and that with different children. Dr. Kidd in answer to various questions explained many of the details of the working of the school inspection.

Dr. Buist showed various specimens of uterine cancers, and delivered a paper on "*Responsibility in the Early Diagnosis of Uterine Cancers*." Of 85 cases occurring during 5 years in the Royal Infirmary, cancers of vulva numbered 4, of vagina 1, of corpus uteri 6, and of cervix 74. The primary results in the cervical cases were :—Relieved 17, unrelieved or died untreated 38, died after treatment 13, and declined treatment 6. The operations were classified thus :—Vaginal hysterectomy 4, abdominal hysterectomy 25, operation begun but not completed 7. From the histories of the foregoing cases he came to two conclusions, first, that the patient reached the gynecologist too late, and secondly, that the condition is recognised too late. The results of operation in mammary cancer were now improved owing to better recognition, and the same would occur in uterine cancer if the following signs had due attention paid to them. These were bleeding, which was irregular and easily excited, discharge, perhaps not definitely bloodstained, and cachexia, though the last was the sign of a neglected case.

Mr. Greig showed a pelvis from a case of locomotor ataxia with *Charcot's disease*. The right hip-joint was affected along with the crest of the ilium, where there was an outgrowth of bone at the attachment of the muscles, and also round the tip of the ischial tuberosity on the same side. Dr. J. Mackie Whyte described a somewhat similar case in his own experience. Mr. Greig also read a paper in which he told of a case of *tumour of the breast* which had recurred six times during a period of thirty years. In 1872 she was struck in the breast by the horn of a cow, and eighteen months later a little hard nodule

in the inner left quadrant was excised. In 1881 the entire breast was removed. In 1888, 1889, and 1898 recurrences were excised. On the last occasion there was no evidence of enlargement of axillary glands, but the clavicle and coracoid process were removed. Much relief was given, and the wound healed well. In 1900 recurrence took place, and she died three years later at the age of 74. At the post-mortem examination secondary nodules were discovered down the vertebræ, and extension had occurred entirely by continuity. Mr. Greig had expected a diagnosis of sarcoma, but the pathological report was that the tumour was an alveolar carcinoma.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., AND JOHN D. COMRIE, M.D.

CLINICAL STATES PRODUCED BY DISORDERS OF THE PITUITARY BODY.

IN his recently published monograph, *The Pituitary Body and its Disorders*, Professor Harvey Cushing, who has been one of the foremost investigators in this field of research, presents a most interesting account of the brilliant results that have accrued from an experimental study of the hypophysis and from clinical observations upon the morbid states resulting from disorders of this gland. He draws attention to the fact that its well protected position, its presence in all vertebrates, its persistence throughout life, and its remarkably disposed and abundant blood supply would of themselves be enough to stamp the hypophysis as an organ of vital importance. It consists of two distinct portions, an anterior lobe or pars anterior and a posterior lobe. From the researches of Schäfer, Vincent, Herring, Borchardt, Pal, Ott, Mackenzie, and other investigators we know that the effects induced by injection of extracts of the posterior lobe bear a close resemblance to those obtained by using extracts of suprarenal medulla. They differ from the latter, however, in the primary depressor and longer pressor response of the general circulation, in the slowing of the pulse rate even after atropin or section of the vagi, in the constriction of the coronary and dilatation of the renal vessels (adrenalin having an opposite effect), in the production of diuresis from a specific action on the renal epithelium, and in their direct action on the voluntary muscles rather than on the sympathetic nerve endings.

The constitutional disturbances observed by Cushing in animals that had recovered after partial hypophysectomies are of particular interest, for these findings gave the first experimental proof that certain hitherto recognised clinical syndromes are a consequence of lessened pituitary activity. The most striking changes observed in the experi

mental dogs were widespread adiposity, dryness of the skin, falling out of the hair, subnormal temperature, lowering of the cardiac and respiratory rate, retardation of skeletal growth, dulling of the mental condition, and the onset of secondary changes in other ductless glands. Puppies remained sexually infantile. Moreover, experimental research has demonstrated that normal functional activity of the posterior lobe of the pituitary is essential for effective carbohydrate metabolism. An intravenous injection of posterior lobe extract produces glycosuria, and its continued administration in excessive amounts leads to emaciation. A diminution of posterior lobe secretion occurring in certain conditions of hypopituitarism leads to an acquired high tolerance for sugars, with a resultant accumulation of fat.

Clinical Manifestations.—In the case of the thyroid gland we are familiar with states of overactivity (hyperthyroidism, exophthalmic goitre), of underactivity (hypothyroidism, myxœdema), and transitional states (dysthyroidism). According to Cushing the clinical affections resulting from disorders of the pituitary are most appropriately regarded as manifestations of dyspituitarism, the symptoms of which are :—

I. *Neighbourhood Signs and Symptoms*—(1) *Subjective Phenomena.*— Headache is usually bitemporal and often severe and persistent. Photophobia may be associated with orbital discomfort and sensitiveness of the eyes to pressure. (2) *Deformation of the Sella Turcica.*— Since Oppenheim in 1899 drew attention to X-ray studies of the pituitary fossa these have proved most valuable in the investigation of pituitary disease. Stereoscopic plates are desirable in all cases and are essential in some instances, in order that the full depth of the sella turcica may be recognised. The enlargement of the sella may be accompanied by thickening of its walls, as in cases of acromegaly and gigantism ; or there may be marked thinning with perforation of the sellar floor and of the dorsum in consequence of pressure atrophy in cases of advanced hypopituitarism. In a third variety the sellar landmarks, with the exception of the anterior clinoid processes, are effaced, a result that may arise in cases of malignant growth of the hypophysis. (3) *Visual Disturbances.*—The optic nerves are apt to suffer, but the degree of implication of the optic chiasma, nerves, or tracts bears no direct relation to the size of the sella turcica. In most of Cushing's cases of acromegaly there was an enlarged sella without visual disturbance, whereas in many patients with primary hypopituitarism profound visual disturbances were noted. The resulting optic atrophy is a so-called primary one, and the disc presents no œdema except in the late stages when general pressure phenomena have arisen. Some distortion of the visual fields is usually detected in cases with pronounced neighbourhood symptoms, but typical bitemporal hemianopia with a vertical meridian bisecting the macula is comparatively rare. Homonymous

defects are at least half as frequent as bitemporal ones. In all cases the colour fields are involved first, the form fields later. (4) Nystagmus, anosmia, trigeminal neuralgia, epileptiform seizures with a gustatory or olfactory aura, and evidences of involvement of the frontal lobes may be observed in some instances. Among naso-pharyngeal signs mention may be made of epistaxis, mucous discharge from the sphenoidal cells, which is common, and genuine cerebro-spinal rhinorrhœa, which is rare.

II. *General Pressure Symptoms* may result from intra-cranial extension of a pituitary tumour or of a coincident growth elsewhere. Headache and choked disc are not infrequent, vomiting is exceptional. Among other signs there may be fulness and tortuosity of the palpebral venules and of the larger veins of the scalp.

III. *Glandular Manifestations*—(1) *Modifications of Skeletal Development*: (a) *Overgrowth*.—The theory attributing the skeletal changes in acromegaly and gigantism to a functional hyperplasia of the pars anterior of the pituitary with production of an excessive or perverted secretion, although not universally accepted, affords the most acceptable working hypothesis. There can be little doubt, however, that in the greater number of cases of acromegaly glandular insufficiency supervenes as the malady progresses. Cushing's studies on carbohydrate tolerance show that in acromegaly the individual's capacity to assimilate sugars progresses from a state in which carbohydrates are metabolised rapidly to one in which they are merely stored: in other words, from a state in which there is either a low assimilation limit or an actual hyperglycæmia with glycosuria to one in which alimentary glycosuria is difficult or impossible to elicit. Cushing advances this fact as the strongest argument in favour of the transitional character of acromegaly from hyper- to hypo-pituitarism and on this character he lays particular emphasis. The skeletal changes in gigantism and acromegaly result from the same morbid influence. If all giants are not acromegalics they are destined to acquire acromegalic attributes with advancing years, provided epiphyseal ossification occurs before the pituitary overactivity subsides. Cushing sums up the evidence in stating that acromegaly is the expression of a functional instability of the pars anterior occasioned by some underlying biochemical disturbance which leads to the elaboration of a perverted or exaggerated secretion containing a hormone that accelerates skeletal growth—growth of the long bones if epiphyseal union is incomplete, of the acral parts if epiphyseal ossification has taken place. Since the functional disturbance is probably a fluctuating one, with periods of increase and remission, epiphyseal ossification may occur during a period of quiescence. A subsequent resumption of the perverted functional activity will then serve to superimpose acromegalic manifestations on primary gigantism. Thus acromegaly cannot precede gigantism, but always occurs as

gigantism that has become acromegalised. (b) *Skeletal Undergrowth.*— The most marked cases are those in whom the pituitary insufficiency occurs before adolescence. Many cases of skeletal undergrowth associated with genital dystrophy have been recorded, but not all forms of infantilism are necessarily due to hypopituitarism (Herter, Peretz). When hypopituitarism dates from the period of adolescence the arrested development of the long bones may be accompanied by pronounced adiposity, and in males by a feminine type of skeleton with broad pelvis and genu valgum. The smallness and delicacy of the extremities, the tapering type of hand, and the persistence of epiphyseal lines are notable. In some instances a maxillary prognathism is observed in contradistinction to the mandibular prognathism of acromegaly.

(2) *Cutaneous and Subcutaneous Changes.*—In hyperpituitarism it is usual to find hypertrophy of the epidermis, the hair follicles, the papillæ and secretory glands of the skin, and an increase of the subcutaneous tissues. In primary hypopituitarism, on the other hand, the skin is often remarkably smooth, transparent, and free from moisture. The nails are usually small, and do not show crescents at their base. Although the hair of the scalp may be abundant the axillary and pubic hair may be almost entirely absent, or in males the latter may assume the feminine type of distribution. Pigmentation, with asthenia and low blood-pressure, due to suprarenal inadequacy, may be observed.

Adiposity is often a striking feature. The particular symptom-complex of adiposity—high sugar tolerance, subnormal temperature, slow pulse, asthenia and drowsiness—is attributed by Cushing to secretory deficiency of the posterior lobe. The reverse condition—emaciation, glycosuria, and elevated temperature—follows administration of posterior lobe extract. Various types of adiposity have been described (Frohlich's, Marburg's, etc.). Insufficiency of the posterior lobe may be associated with either stimulation or inhibition of anterior lobe activity. Consequently, in childhood, obesity may be associated with (1) overgrowth and either sexual precocity or genital hypoplasia, or with (2) undergrowth and sexual precocity or the reverse. In adults the fat may tend to occur in lipomatous masses, and in some of Cushing's cases the four cardinal signs of adiposis dolorosa (Dercum's disease), namely adiposity, tenderness and pains, asthenia, and psychoses, were noted.

(3) *Carbohydrate Tolerance.*—Borchardt found that intravenous injection of posterior lobe extracts produced glycosuria, and that after removal of the posterior lobe the assimilation limit for carbohydrates was raised. Patients with obvious manifestations of hypopituitarism usually present a high tolerance for sugars, and Cushing regards the sugar tolerance of these individuals as a measure of the activity of the posterior lobe. Polyuria and glycosuria may be the main clinical manifestations of acute hyperplasia of the pituitary, and moreover

the glycosurias of pregnancy and of adolescence may possibly be due to functional hypophyseal hyperplasia.

(4) *Temperature.*—In experimental pituitary insufficiency the temperature is subnormal, and the same holds good for clinical cases of hypopituitarism. A transient rise of temperature may follow an injection of pars anterior extract.

In hypopituitarism the arterial blood-pressure is low, the pulse-rate is infrequent, and drowsiness and torpidity may be observed. The resemblance between the state of extreme hypopituitarism and that of hibernation is highly suggestive.

(5) *Psychical Disturbances* have been noted in many cases of pituitary disease. Irritability, insomnia, low intellectuality and impairment of memory may be observed. Epileptic seizures are not uncommon. In many cases there are further symptoms referable to disorders of other glands—ovary, testis, thyroid, thymus, pancreas, etc.

Treatment.—In each case, according to Cushing, it is necessary to determine the local conditions and, as far as possible, the state of hypophyseal activity. One patient may need sellar decompression, another may require partial extirpation of the diseased gland, and yet another may require glandular feeding; or combinations of these measures may be necessary. Surgical intervention may be indicated to relieve general pressure disturbances or to combat functional hyperplasia, but more especially to relieve neighbourhood symptoms. In many instances the symptoms of hypopituitarism can be ameliorated by administration of pituitary gland. Dry powdered extracts of the whole gland should be given. Cushing uses the sugar tolerance of the patient as an effective measure of the organo-therapeutic dosage. Thus, while the pituitary extract is being given by the mouth, the patient is given daily an amount of glucose (or lævulose) that would suffice to set up temporary glycosuria in a normal individual of equal body weight. Meanwhile an increasing amount of the glandular extract is administered daily until a trace of sugar appears in the patient's urine. Some patients, however, are intolerant of the sugar tests, and others, even although taking massive doses of pituitary extract, fail to develop glycosuria, and yet nevertheless their general condition improves.

W. T. R.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

THE SURGERY OF NERVES.

THE researches of Stoffel (*Münch. med. Woch.*, 1911, No. 47) on the minute anatomy of the larger nerves, and the disposition in them of the bundles of nerve fibres supplying different groups of muscles, have

opened up what promises to be a very fruitful field of clinical investigation and therapeutics.

Stoffel has shown that in the larger nerve trunks the nerve bundles for special groups of muscles are not, as was formerly supposed, arranged irregularly and fortuitously, but that on the contrary the nerve fibres to a particular group of muscles have a typical and practically constant position within the nerve.

In the large nerve trunks of the limbs he has worked out the exact position of the bundles for the various groups of muscles, so that in a cross section of a particular nerve the component bundles can be labelled as confidently and accurately as can be the cortical areas in the brain. In the living subject, by using a fine needle-like electrode and a very weak galvanic current, he has also succeeded in differentiating the nerve bundles for the various groups of muscles.

Stoffel at once illustrated the practical value of these observations, for in several cases of spastic paralysis he succeeded in picking out in the nerve trunk of the affected limb the nerve bundles supplying the spastic muscles and, by resecting portions of them, in relieving the spasm. In a case of spastic contracture of the pronator muscles of the forearm, for example, an incision is made along the line of the median nerve above the bend of the elbow. At the outer side of the median nerve, where it lies in contact with the biceps muscle, is situated a well-defined and easily isolated bundle of fibres which supplies the pronator teres, the flexor carpi radialis, and the palmaris longus muscles. On incising the sheath of the nerve this bundle can be readily dissected up and its identity confirmed by stimulating it with a very weak galvanic current. An inch or more of the bundle is then resected.

At the Congress of the German Society for orthopædic surgery in Berlin in April 1912, Stoffel (*Verhandl. d. deutsch. Gesellsch. f. orthop. Chir.*, 1912, Bd. xxx. 1) contributed a detailed description of the technique of his operation as applied to the various nerve trunks of limbs. Several other surgeons reported cases in which they had employed his methods with success.

In cases of paralysis of a group of muscles in a limb, anastomosis of a portion of the proximal end of the nerve supplying the opposing group of muscles with the distal end of that supplying the paralysed ones, though strongly advocated by Spitzy, has not been attended with much success. With the more precise knowledge of the structural anatomy of the large nerves which we now possess this method of treating various forms of paralysis may be put on a more rational and scientific basis. Much interest therefore attaches to the report by Stein (*Munch. med. Woch.*, 25th June 1912) of a successful case of such plastic nerve surgery carried out in the light of Stoffel's researches. In the case of a boy aged nine years, who suffered from Weber's paralysis with right-sided ophthalmoplegia interna and spastic paralysis of the left

arm and leg, Stein anastomosed the fibres of the median nerve which supply the flexors of the hand and the pronator teres, *i.e.*, the fibres lying in the outer third of the nerve, with the musculo-spiral nerve. Before operation the hand had been constantly in a position of full flexion at the wrist ; the extensor muscles, however, with one exception, had reacted to a very strong electrical stimulus. Three months after operation the extensor muscles began to show signs of returning power, and this steadily increased until, six months after operation, the boy could extend the hand into line with the forearm.

In spite of the good results which already have been attained, Lorenz is doubtful whether for spasm and contracture nerve section should replace tenotomy, and whether in other cases nerve anastomosis is really of more value than tendon transplantation. Lange pointed out that caution must be observed in practising nerve anastomosis, for, although the results of this method may be as good as or even better than those of tendon transplantation, the risk of doing harm is much greater in the former than in the latter case.

All were agreed that a new impetus had been given to the surgery of the peripheral nerves, but also that further work must be done, and the late results of such operations ascertained, before the real worth of this discriminating method of nerve section and anastomosis could be determined.

Traumatic Arthritis of the Knee.

Under the headings Traumatic Arthritis, Traumatic Hydrops, and Villous Arthritis there are grouped, according to Smith (*Canad. Med. Assoc. Journ.*, October 1912), a variety of changes in the knee-joint which are due to the same causes, which follow insensibly the one on the other, and which, if not suitably treated, may all end in a condition indistinguishable from a rheumatoid arthritis. When, owing to a strain, there has been an effusion into the knee-joint, the ligaments are stretched, and, as Griffiths has pointed out, their return to normal is a matter of months rather than weeks. The synovial membrane which is in close relationship with the relaxed ligaments tends to become puckered. In addition, owing to the enforced rest, atrophic changes occur in the quadriceps muscle, and as a result the ligamentum mucosum is not put on the stretch and does not exert its normal compressive action on the infra patellar pad of fat during movements of extension. The infra-patellar pad consequently becomes nipped between the articular surfaces of the femur and tibia when the joint is extended, and, as a result of this nipping, fresh exudation is produced. A vicious circle is then set up, and all the elements for the production of a villous arthritis are at hand. Haemorrhages take place into the pad of fat and fibroid changes occur, so that in these cases the infra patellar pad is not only hypertrophied but tougher and more fibrous than normal. Owing to frequent injury the synovial membrane, particularly in the region of

the ligamenta alaria, becomes elongated into long finger-like masses, simulating villi, which are very vascular and hyperæmic. As time goes on degenerative changes occur in the villi. The change most commonly seen is fatty degeneration, the ends of the villi frequently developing into distinct lipomata ; occasionally small cartilaginous and bony masses develop in the fringes, and the separation of these gives rise to one variety of "joint mice." It is very difficult to decide where such villous change ends and hypertrophic changes of a rheumatoid nature begin.

In the early stages of this trouble the treatment should consist in limiting the movements of extension by the use of a cage splint so arranged that the hinge-joint locks at thirty degrees from full extension, the splint being worn day and night. An essential part of the treatment is firm and energetic massage of the quadriceps extensor. as on the maintenance or the recovery of tone of that muscle depends very largely the success of the treatment. Operative treatment is best reserved for those cases in which, from occasional locking of the joint it is clear that there are well-marked pendulous masses, and that lipoma arborescens has formed.

Diffuse Gonococcal Peritonitis.

The important part played by the gonococcus in the etiology of localised pelvic peritonitis in the female is generally conceded ; not so, however, the fact that a diffuse purulent peritonitis may result from a pure gonococcal infection.

Albrecht (*Münch. med. Woch.*, 15th October 1912) records four cases of the latter condition, the gonococcus being recovered in pure culture from the exudate in each case. The clinical picture in each was the same, viz., sudden, very acute, onset. the development within a very short time of the signs of a severe diffuse peritonitis, and the rapid subsidence of all symptoms after operation, fully bearing out the dictum of Döderlein that "gonococcal peritonitis, in spite of its acute character, is distinguished by its rapid course and favourable termination."

The cases comprised three females and one male, and, in all, the diagnosis before operation was "acute appendicitis with peritonitis." At the time of onset of their abdominal symptoms three of the patients were suffering from acute gonorrhœa. In each case on opening the abdomen a considerable quantity of sero-purulent fluid escaped, and the infection was seen to be diffuse. if not generalised. An immediate microscopic examination of the fluid revealed the presence of the gonococcus, and in view of the benign nature of the infection the abdomen was closed without drainage in three of the four cases. The recovery in all was rapid and uneventful.

In one case repeated differential blood counts were made to deter-

mine if there were present the eosinophilia on which several writers have laid stress as a sign of an ascending gonorrhœal infection ; on no occasion, however, was the slightest degree of eosinophilia found.

Albrecht claims that these are the first undoubted cases of diffuse gonococcal peritonitis which have been recorded. He believes that in them the rapid spread and diffuse character of the peritonitis was due to a specially virulent strain of gonococcus, which by its rapid spread allowed the peritoneum no time to form the plastic fibrinous adhesions which characterise the usual pelvic type of gonococcal peritonitis. D. P. D. W.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

THE PHYSIOLOGY OF PREGNANCY.

The Meiostagmin Reaction.—Almost every month at the present time brings discoveries in the department of the physiology of pregnancy, and it may not be long before it will be possible to draw general conclusions regarding the biochemical and biophysical nature of the process of gestation. Dr. Antonio Julehiero, for instance, has been investigating the meiostagmin reaction in pregnancy, and has obtained somewhat surprising results (*Wien. klin. Woch.*, 24th October 1912, xxv. pp. 1699-1701). The principle underlying this reaction is the employment of the measurement of the surface tension of a mixture of antigen and antibody as a means of discovering whether an interaction has occurred. The surface tension is measured by an instrument by which the number of drops in a given quantity of liquid can be counted ; that which is commonly used is Traube's stalagmometer. Of course the more numerous the drops are the smaller they must be, and the smaller they are the lower the surface tension is. If we take, for instance, mixtures of such antigens as typhoid and tubercle bacilli extract and typhoid and tuberculous serums, we find that their surface tension is lowered as compared with that of normal serum. So also a mixture of extract of cancerous tissue (antigen) and of the blood serum of a cancer patient (antibody) reveals a lowering of the surface tension ; this result does not follow if the blood of a normal individual is employed. At one time it was thought that this meiostagmin reaction gave a certain test for malignant tumours, but that has not turned out to be the case. Indeed it was soon found that it held also for typhoid fever and tuberculosis, and for ankylostomiasis and hydatid disease (echinococcus). Now Dr. Julehiero comes forward with the discovery of this reaction in the blood of pregnant women. He was led to make his observations on account of the existence of certain resemblances between the blood

and urine of cancer patients and those of pregnant women, viz., the increased antitryptic power of the blood serum in both, an increase in the acid proteid nitrogen and in the polypeptid nitrogen of the urine in both, the absence of the carcinolytic property of the blood serum (Freund and Kaminer's test) in both, and the frequent presence of Calmette's reaction (cobra venom) in cancer as well as in pregnancy. Dr. Julchiero employed the methods of Ascoli and Izar and of Micheli and Cattoretti. and used three kinds of antigens, viz., methylalcoholic extracts of malignant tumours, of dried pancreas (of the dog), and of human placenta (age, three to five months); these were tested with the blood serum of patients suffering from malignant growths and with other maladies, with that of normal individuals, and with that of pregnant women (taken from the retroplacental blood and from that of the umbilical cord). It was found that in pregnancy there was in the great majority of cases a positive meiostagmin reaction, although it did not reach quite so marked a degree as was observed sometimes in patients suffering from neoplasms. This discovery is of importance in two directions—it weakens the clinical value of the meiostagmin test of malignancy during pregnancy, and it increases the evidence already gathered in favour of the existence of a chemical and biological parallelism between cancer and pregnancy.

But why should the blood conditions in pregnancy resemble those in malignant disease? Dr. Julchiero does not attempt to answer this riddle in hæmatology, and it may be doubted whether an answer is at present possible. Of course in each case there is a centre of extraordinarily active cellular growth within the body, although in pregnancy the growth is restrained, regulated, and differentiated, whilst in the cancer it is unrestrained and results in the continued production of one type of cell. Still there may be some influence at work in both conditions which, without being identical in nature, produces the same ultimate effect on the chemical and physical state of the blood serum. Judgment must in the meantime be suspended, but this path of investigation should be closely followed up.

The Fœto-Placental Quotient.—In an interesting graduation thesis of Toulouse (1912) Amigue deals with the relation between the weight of the placenta and that of the fœtus (*La gynécologie*, August 1912, Ann. xvi. p. 508). He finds that the fœto-placental quotient, viz., the weight of the fœtus divided by the weight of the placenta, is relatively constant. It has the average value of 6, but it may vary from 5 to 8 even under normal conditions. With an increase in the number of confinements the quotient tends to rise, and Amigue concludes that the more children a woman has, the more nearly the conditions of pregnancy approximate to the physiological optimum. Of course various morbid states, such as death of the fœtus, modify the fœto-placental quotient. At the beginning of pregnancy the quotient is hardly equal

to 0·27, but by the end of the fourth month it has reached 1, and it increases progressively up to the time of labour, when it is 6. Cases in which it is below 5 must be regarded as due to an arrest of development or persistence of the foetal state. It may turn out to be of value, in view of the future health of the infant, to register in some way or another the foeto-placental quotient at birth.

Transmission of Antibodies.—In an almost encyclopaedic article Dr. Maunu af Heurlin (of Helsingfors) summarises the present state of our knowledge of the question of the transmission of antibodies from ascendants to descendants, from parents to progeny (*Arch. mens. d'obstét. et de gynée.*, June 1912, Ann. i. pp. 497-580). The paper is a mine of information on such matters as the placental and lactational transmission of antibodies from mother to foetus in the human subject, in the horse, ass, pig, cow, goat, sheep dog, cat, rabbit, guinea-pig, rat, and in the mouse; on the transmission of the anaphylactic state; and on the passage of antitoxin from hen to chicken. The conclusions themselves occupy six pages, so that it is only possible to touch upon a few of the points discussed

For instance, the author finds that in physiological circumstances the normal proportionate amount of antibody in the maternal serum is nearly always greater than that in the foetal serum, a fact which goes to establish the individuality of the foetus *in utero*. The above law holds for a large number of antibodies, *e.g.*, antitryptic, haemolytic, agglutinative, etc.; but in a few others (diphtheria antitoxin, antivibriolytic, and in most cases of opsonic power) the ratio in the maternal and foetal serum is practically the same. The amniotic fluid in the human subject is, under physiological circumstances, much less rich in antibodies than the foetal serum. A very important conclusion is that the transmission of an acquired immunity from parents to offspring is possible only through the mother; the father has no influence at all in this connection. In the case of the mother the route of transmission of the antibodies may be placental or by the milk in lactation. The placental transmission of antibodies formed in the mother took place regularly in all the animals which were immunised by any antigen, pathogenic or non-pathogenic, for the species experimented with. It also took place if the antibodies were incorporated in the maternal organism in the form of a homologous or a heterologous serum. The ratio of antibodies in the serum of the new born (at the time of birth) was more nearly the same as that in the mother's serum when the contact of the antibodies with the placenta had been prolonged and when the absolute ratio in the mother was high. In the case of small animals the foetus itself did not form antibodies when the mother animal has been actively immunised in gestation, but in the case of large animals the foetus may participate. Large differences in the results of transmission experiments are to be explained

by great individual differences in the maternal capacity for forming antibodies within the same species. If the antibodies are circulating in abundance in the maternal blood they pass with great rapidity through the placenta. Thus twenty-four hours after the intravenous injection of a homologous serum containing antibodies, the fœtal serum contains a ratio equal to half the maternal ratio. Under these circumstances even the liquor amnii may contain some antibodies. The passage of antibodies by the milk takes place more easily than through the placenta, and the absence of antibodies from the milk is observed only when the ratio of them in the maternal serum is very low.

An important part of this inquiry on the practical side is the influence which *vaccination* of the mothers has upon the infants afterwards born. Statistics vary considerably. Gast, Wolff, Behm, and Palm were nearly always able to vaccinate successfully the infants of women who had been vaccinated in pregnancy, whilst Lop, Piery, and Mas, dealing with larger numbers of cases, got negative results in from 60 to 66 per cent. of the new-born infants. The author thinks that the differences are to be explained by the strength of the vaccine employed: those who obtained negative results used ordinary vaccine, whilst those who always succeeded in vaccinating the new-born infants used a particularly active vaccine. But even those who got successful results noticed that the vaccinal reaction was feebler and that the formation of pustules was delayed. It is necessary to believe, therefore, that a feeble immunity transmitted by the mother may be overcome by a very virulent vaccine. Some of the differences obtained were doubtless due to the length of time the antibodies remained in contact with the placenta. Mas, for instance, found that in women vaccinated before the eighth month, vaccinal immunity was transmitted in 75 per cent. of the cases, in those vaccinated in the eighth month in 63 per cent., and in those vaccinated in the ninth month in only 44 per cent. There are many other important facts discussed in this article, but there is no possibility of dealing with them all here, and the reader is referred to the original source. The paper ends with a copious bibliography containing 222 references arranged alphabetically under the names of authors.

X-Ray Diagnosis of Pregnancy.

Dr. Edling has examined twenty-two cases of pregnancy by means of the Röntgen rays, and regards this means of diagnosis as very valuable (*Arch. mensuelles d'obstét. et de gynéc.*, June 1912, Ann. i. p. 582). The chief difficulties are the thickness of the uterine walls, the slight density of the fœtal skeleton, the presence of the liquor amnii, the respiratory movements of the mother, and the active movements of the fœtus ; but these can all be overcome by the careful placing of the patient and by the shortness of exposure made possible

by the intensity of the secondary current employed. In five different directions the X-rays were helpful. First, the diagnosis of early pregnancy (end of second and beginning of third month) was made with success in two cases; these would seem to be the first cases reported at so early a date. In one other case the diagnosis was prevented by the fact that the uterine wall was thickened by the presence of fibroids in it. Second, the rays were the means of excluding the possibility of pregnancy in a case of an abdominal tumour; laparotomy confirmed the diagnosis. Third, in later pregnancies, where palpation was rendered difficult by obesity, hydramnios, uterine tumours, etc., the X-rays gave important aid, especially in cases of transverse and pelvic presentation. Fourth, the diagnosis of twins was made in two cases by the use of the rays; in one of these it was confirmed later by the birth of twins, and in the other there turned out to be triplets. In several other cases the possibility of twins was excluded, and subsequent events substantiated the exclusion. Finally, it is possible that röntgenography may aid in the differential diagnosis of ectopic gestation, and it is stated that if the foetal shadow is situated clearly to one side of the middle line of the pelvis, the ectopic nature of the pregnancy is confirmed. Dr. Edling is of opinion that the use of Gehler's screen excludes the possibility of danger to the mother or the foetus from the rays themselves. Some cases were examined six or seven times with no evil effects. J. W. B.

LARYNGOLOGY, OTOLOGY, AND RHINOLOGY.

UNDER THE CHARGE OF

A. LOGAN TURNER, M.D., AND J. S. FRASER, M.B.

OTOSCLEROSIS.

THIS obscure condition appears likely to remain for many years a matter of dispute, and would form a better subject for international scientific investigation than the "Ozæna Question." In otosclerosis we have a form of chronic progressive deafness in which the middle ear structures are apparently normal, and yet on functional examination with tuning forks we get, at least in the early stages, the results which are usually associated with a lesion of the sound-conducting mechanism. The disease has been called by many names—ostitis stapedio-vestibularis, dry middle ear catarrh, ostitis vasculosa, capsulitis labyrinthi, spongification of the labyrinth capsule, etc. From these various titles it is apparent that there is no general agreement as to the pathology of the condition. Most writers assert that the disease must be distinguished from chronic middle ear catarrh and the results of former suppurative otitis media on the one hand, and from lesions of the inner ear and auditory nerve on the other. It is, how-

ever, open to doubt if the condition known as otosclerosis is a pathological entity.

Anatomy.—Under normal conditions the membranous labyrinth is surrounded by two distinct layers of bone. The inner of these two, the labyrinth capsule proper, is composed of dense bone, which is directly derived from the cartilaginous otic capsule of the embryo. This is easily distinguished from the rest of the petrous bone by the fact that it contains interglobular spaces in which cartilage cells are seen. Surrounding this cartilage bone, but distinct from it, we have the rest of the petrous bone. On the inner wall of the tympanic cavity there are thus two layers of bone, the outer formed from the deep layer of the tympanic mucoperiosteum, while the inner layer is derived from the fœtal cartilaginous capsule. The footplate of the stapes is connected with the margins of the oval window by means of the annular ligament. The adjoining edges of the oval window and the footplate are covered by a thin layer of hyaline cartilage.

Pathology.—Otosclerosis is characterised by changes in the structure of the bone surrounding the labyrinth, leading in most cases to ankylosis of the stapes. In certain areas, especially in the region of the oval and round windows, the normal bone is absorbed and replaced by vascular spongy osteoid tissue, which later on becomes dense bone. These foci of new bone are more or less sharply defined from the normal bone, as the youngest part of the new bone stains very deeply with hæmatoxylin. This part shows many spaces containing osteoblasts and osteoclasts along with numerous dilated capillary blood-vessels. In the older portion of the new bone the trabeculæ become thicker, the open spaces smaller, and the blood-vessels less numerous. Bony lamellæ begin to be deposited round the vessels, as in normal Haversian systems, and the bone loses its special affinity for hæmatoxylin. Fatty and occasionally also gelatinous marrow containing a few lymphocytes is seen. In the very oldest part of the new tissue the bone is solid and shows regular lamellar systems, but does not contain the cartilaginous interglobular spaces which are characteristic of the normal labyrinth capsule. According to Manasse (*Die Ostitis Chron. d. mensch. labyrinth. Kapsel,* Wiesb., 1912) all the new deeply stained tissue is in time absorbed by osteoclasts and replaced by the paler bone. At the advancing edge of the disease focus there are almost no osteoclasts, and for this reason Manasse and Moeller (*Monatschr. f. Ohrenheilk.,* 1905, 125) believe that the resorption of the normal bone is caused by the pressure of the new tissue. They also hold that the process advances along the blood-vessels. The most common site for these foci is on the promontory just in front of the round window, but the region of the oval window is frequently involved, and in many cases the stapes becomes ankylosed to the margins of the oval window by a mass of spongy new bone. According to Habermann (*Arch. f. Ohrenheilk.,* Bd. liii. ; *ibid.,* Bd. lx.)

and Katz (*ibid.*, Bd. lxviii. ; *Monatschr. f. Ohrenheilk.*, 1906, 572) there is, in some cases, a thickening of the mucoperiosteum on the inner wall of the tympanic cavity, but as a rule the mucosa is normal. This would point, at least in some cases, to an inflammatory condition of the tympanic mucous membrane, and it is quite possible that catarrhal otitis media had formerly been present even in those cases in which the mucosa is seen to be normal on microscopic examination (Chalmers Watson). In advanced cases of otosclerosis there is a certain amount of degeneration of the nervous structures of the labyrinth in addition to the bony changes already mentioned.

Almost all the writers upon this subject are agreed that the bony changes are inflammatory in nature, but there is a marked difference of opinion as to the original seat of the disease. Politzer (*Monatschr. f. Ohrenheilk.*, 1908, 419), Moeller (*ibid.*, 1905, 125), and others believe that the labyrinth capsule is the primary seat of trouble, whereas, according to Habermann, Katz, and Heiman (*ibid.*, 1909, 761), the mucoperiosteum of the middle ear is the starting-point. In support of his theory Politzer states that in several cases foci of disease have been found in the deeper parts of the labyrinth capsule surrounded by perfectly healthy bone, and, further, that foci occur at the internal auditory meatus where there is no mucous membrane. Habermann and Katz, on the other hand, find small diseased areas in the periosteal layer of the promontory underlying a thickened and infiltrated mucous membrane. Alexander (*Arch. f. Ohrenheilk.*, Bd. lxxviii) and Scheibe (*Verhandl. d. deuts. otol. Ges.*) have demonstrated that similar bony changes may be associated with chronic suppurative otitis media, and Alexander has informed one of the present writers that some cases of otosclerosis undoubtedly proceed from the mucoperiosteum of the middle ear. Gray of Glasgow (*Dis. of Ear*, 1910) regards the disease foci as areas of aseptic necrosis which may also occur in other bones of the skeleton ; in this connection it is interesting to note that in one case Katz found changes in the tympanic ossicles similar to those present in the labyrinth capsule.

Etiology.—Broadly stated the general opinion seems to be that the disease is a local manifestation of a general toxic condition. *Heredity* is a characteristic feature of the disease. Bezold (*Zeitschr. f. Ohrenheilk.*, Bd. xxvi.) has traced a family history of otosclerosis in 52 per cent of his cases. Hammerschlag (*Monatschr. f. Ohrenheilk.*, 1910, 229) regards otosclerosis, progressive nerve deafness, and hereditary deafmutism as differing manifestations of the same hereditary disease ; his view is based on the discovery of foci of altered bone in deafmutes similar to those seen in otosclerosis. Alexander confirms this observation. Otosclerosis is more common in the *female* sex than in the male (58 per cent. and 42 per cent. respectively—Bezold, Denker (*Die Otosklerose*, Wiesb., 1910), and Hartmann (*Zeitschr. f. Ohrenheilk.*, Bd. xxxiii.). The

age incidence is very difficult to estimate, as the onset of the disease is insidious. Denker gives it as approximately 20 to 50 years. It is highly probable that in most cases the disease has been advancing for a long time before the symptoms become severe enough to cause the patient to seek advice: indeed some authors even go so far as to hold that the disease is already present in embryonic life—Ferreri (*Arch. Internat. de Laryngol.*, January-February 1912). Among the constitutional and other conditions which have been blamed rightly or wrongly, as possible causes of otosclerosis are :—gout, rheumatism, arthritis de formans, anæmia, arteriosclerosis, intestinal autointoxication, vasomotor disturbances, changes due to puberty and pregnancy, rickets, osteomalacia, syphilis, disorders of menstruation, ozæna, etc. Siebenmann has attributed the onset to exposure to severe *cold* in a few cases. With regard to syphilis numerous observations have recently been made by Busch, Beck, Zange (*Zeitschr. f. Ohrenheilk.*, Bd. lxii.), and others in regard to the Wassermann reaction in cases of otosclerosis, but in almost all of these the reaction was negative. Otosclerosis is undoubtedly aggravated by pregnancy or by intercurrent diseases or accidents. Ferreri looks upon otosclerosis as a latent autointoxication of rachitic or osteomalacic origin, and has found that many women suffering from the latter disease are distinctly dull of hearing. Siebenmann (*ibid.*, Bd. xxxiv. and xxxvi.) and Koerner (*ibid.*, Bd. l.) believe that the condition is really the final stage of a growth process in the petrous bone, while Denker (*Zeitschr. f. Ohrenheilk.*, Bd. lxvi.) calls attention to the connection between the hypophysis cerebri, pregnancy, and certain changes in bone such as acromegaly and otosclerosis.

Subjective Symptoms.—The chief symptoms are gradually-increasing deafness and tinnitus : they are usually bilateral, and become marked between the ages of 20 and 50 years. The noises are often referred to the head, and may cause the patient much more discomfort than the deafness. According to Denker, Politzer, and Bezold, tinnitus is present in about 75 per cent. of cases, while Kalenda (*Zeitschr. f. Ohrenheilk.*, Bd. lx.) has drawn attention to the fact that noises may be the first symptom. Paracousis Willisii is almost invariably present, *i.e.*, the patient states that she can hear better in a noisy place. Politzer, who regards this symptom as of great diagnostic value, believes that it is due to massage of the ossicles. Heath, on the other hand, holds that it is due to reflex contraction of the stapedius muscle. Giddiness is a rare symptom, occurring in only 5 per cent. of cases (Denker).

Objective Signs.—In otosclerosis the membrana tympani is normal or nearly so : it may, in fact, be unduly transparent. Schwartze (*Arch. f. Ohrenheilk.*, Bd. v.) has pointed out that in a number of cases a peculiar flamingo red shimmer can be seen through the membrane. This appearance is due to the hyperæmia of the promontory, and may be confined to a limited area or may be general. The Eustachian tube is patent,

and, on catheterisation, a loud blowing sound is heard. For this reason it is usually stated that the tube is abnormally patent, but it is difficult to believe that otologists are in the habit of catheterising normal patients. Froeschels (*Monatschr. f. Ohrenheilk.*, 1910) has pointed out that in 95 per cent. of cases there is a marked diminution of cutaneous sensibility in the external auditory meatus as tested by tickling with a fine celluloid bougie. This tolerance to tickling has been found also in meningitic deafness and in deafmutes.

Functional Examination.—Bezold has formulated a symptom-complex or triad for the diagnosis of otosclerosis, which has been found very reliable by most observers. It consists of—(1) a raising of the lower tone-limit (the lowest tuning-forks, C 16, C 32, and even C 64, are not heard); (2) increase of bone-conduction (a medium-pitched tuning-fork is heard on the vertex by the patient after a normal person has ceased to hear it); and (3) Rinné's test is negative (a medium-pitched tuning-fork is heard when placed on the mastoid process of the patient after he has ceased to hear it by air-conduction). In addition to these signs Gellé's test is negative, viz., a vibrating tuning-fork is placed upon the mastoid process and at the same time the nozzle of a Politzer bag is tightly inserted into the external meatus and compressed so as to raise the air-pressure in the meatus and thus drive inwards the tympanic membrane and ossicles. In a normal person in whom the stapes is moveable this procedure results in a raising of the intra-labyrinthine pressure and a diminution in the sound of the fork, but in a case of otosclerosis, in which the stapes is fixed by a bone, no such diminution of the sound occurs. In the early stages of otosclerosis the upper tone-limit is normal, but in advanced cases, where there is some labyrinthine degeneration, the upper tone-limit is lowered.

Diagnosis.—This is made by attention to the following points:—(1) Gradual onset of progressive deafness and tinnitus—usually symmetrical. (2) History of hereditary deafness in the family. (3) The patient hears better in a noise. (4) The tympanic membrane is normal or nearly so. (5) A red shimmer from the promontory may be seen through the membrane. (6) The Eustachian tube is patent. (7) Loss of sensibility to tickling in the external meatus. (8) Loss of the lower tones. (9) Lengthened bone-conduction. (10) Bone-conduction for the medium forks is greater than air-conduction. (11) Gellé's test is negative. (12) The upper tone-limit is normal, at least in early cases. In advanced cases the upper tone-limit is lowered and bone-conduction may be diminished. Denker points out that senile nerve deafness begins after 50 years of age, whereas otosclerosis comes on earlier, and, further, that heredity is not a marked feature of genuine nerve deafness.

Prognosis.—Patients suffering from otosclerosis may be assured that no brain disease is present, and, further, that the condition is not dangerous to life. Otosclerosis does not lead to absolute deafness for

speech, and in many cases there are long periods during which the disease does not advance. Patients may also be informed that the noises usually diminish as the deafness increases. Married women should be informed of the prejudicial effect of pregnancy on the progress of the disease.

Prophylaxis.—Koerner is of opinion that patients suffering from otosclerosis should be advised against marriage.

Treatment.—It must be confessed that, so far as recovery is concerned, treatment is quite useless in genuine cases of otosclerosis : probably for this very reason a large number of drugs and a variety of local measures have been employed.

General Treatment.—Phosphorus (Siebenmann) and sodium iodide (Politzer) have been recommended. Mercurial inunctions have been given in cases of supposed syphilitic origin : arsenic and iron in cases of anaemia. Turkish baths have been advocated for plethoric patients. Recently a substance known as otosclerol has been introduced, but, as yet, the results have not been reported. Ferrari treats his patients with vaccines made from cases of rickets, while Denker suggests the use of pituitarin and of ovarian or orchitic extracts.

Local treatment is better avoided. Inflations of air or medicated vapour, injections of fibrolysin, massage of the membrane and ossicles, faradisation mobilisation and extraction of the stapes have all been tried and abandoned. Heath, who is sceptical as to bony ankylosis of the stapes, treats his cases by painting the drumhead with increasing strengths of blistering fluid : others have recently experimented with X-rays and radium in cases of otosclerosis.

Symptomatic Treatment—Tinnitus.—The patient should be advised to neglect the noises as far as possible : these are always worse when the patient is alone and unoccupied. Potassium iodide and bromide are occasionally helpful. Sacher (*St. Petersb. med. Woch.*, 1908, 40) recommends corrosive sublimate (gr. $\frac{1}{60}$) in pill form twice a day after meals. Hydrobromate of quinine may be tried (3-gr. tabloids), but should be at once discontinued if the noises are made worse. Galvanism has been recommended—the positive pole applied to the ear and the negative pole to the neck : the current is begun at zero and increased up to 3 m.a. and again diminished to zero : the séance lasts for three minutes. In severe cases, in which the incessant noises appear likely to lead to suicide or insanity, the question of cutting the auditory nerve or of destroying the labyrinth may be discussed.

Deafness.—The patient should be encouraged to learn lip-reading as early as possible. Artificial aids to hearing are sometimes of benefit, especially the newer forms, which are constructed on the principle of the telephone.   J. S. F.

J. K. M. D.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, M.D., AND ANGUS MacGILLIVRAY, M.D.

ALBUMINURIC RETINITIS.

ALBUMINURIC retinitis was the subject of discussion at one of this year's meetings of the Ophthalmological Society of France (*Arch d'Ophtal.*, May 1912), the principal *rôle* being filled by Rochon-Duvigneaud. He classifies the cases into two unequal groups, those of albuminuric retinitis proper and those of retinitis of pregnancy. In regard to the former he draws attention to the fact that not infrequently the eye symptoms may be the first decisive indication, but though it is sometimes the case, no doubt, that the first real indication of chronic Bright's disease is the occurrence of retinitis, yet surely that cannot be so frequent as the author seems to suggest : it certainly appears, however, to form at times the first overt sign, or a very early and imperative sign, that the system is beginning to yield under the pressure of a pathological state which has been present, and ostensibly unchanged, for quite a long time. One constant feature of cases of albuminuric retinitis is that the arterial tension is raised : it is not nearly so constantly raised in albuminuria without ocular signs. As everyone knows, retinitis is a sign of very evil significance in a case of Bright's disease, the patient usually dying within a year, but cases have been known of actual recovery : such cases are extremely exceptional. There is nothing actually pathognomonic about any one of the signs of retinitis albuminuria, but the aspect taken as a whole is very fairly distinctive. Cerebral tumour may give rise to an optic neuritis with a star formation at the macula which is all but identical with that found in albuminuria, but with, it is said, less invasion and swelling of the retina surrounding the disc than is present in the kidney cases. Rochon-Duvigneaud regards the vascular alterations rather in the light of very frequent accompaniments than of essential features ; these latter he considers to be represented by the fibrinous and cellular exudations, and particularly the former of these. He concludes that the state of the kidney is responsible for that of the retina, not because of any particular change which the organ assumes, save that elimination is deficient, and consequently urea or some such injurious material is retained in the system, since the kidneys are incapable of eliminating it. It is said to be present in some 2 per cent. or more of cases of albuminuria.

The other section, retinitis of pregnancy, is also of much interest. In this group the author places only those cases in which pregnancy seems to be the basis of the eye manifestation, the sole etiological factor. This form of disease is considered to occur approximately once in 3700 pregnancies, and is *decidedly more frequent in primiparae*. In

a good many more than half the cases the first symptoms are delayed till the last four months of pregnancy. There are two types or grades of the affection—one extremely acute, in which the onset is rapid, and the disease, when sufficiently severe, slays the patient much as a dose of one of the active poisons would do. On post-mortem examination in such a case recent lesions both of liver and kidney were found. But it is more usual for the retinal changes to develop in a subacute case, where no doubt the intoxication is less active. As to the cause, the author considers it most probable that there is a nephritis of pregnancy occasioned by toxaemia. This nephritis is not necessarily permanent, but may be so, and may induce not merely permanent but progressive changes in the kidneys. That this nephritis is the real cause of the retinitis appears practically certain. The relations between lesions of the fundus and the amaurosis of eclampsia are rather obscure, and according to some writers are by no means close, but Rochon Duvigneaud considers that perhaps in some of the cases a sudden and severe intoxication has induced an amaurosis which, had time been given, might have been accompanied or followed by retinal changes. This hypothesis is intended to cover the cases, which are rare but far from unknown, in which uræmic amaurosis comes on abruptly and passes into optic atrophy.

It is a curious point that the light reflex is retained in three-fifths of the cases, and this persistence of the normal is to be regarded as a favourable sign ; in the other two-fifths of the cases it is lost, and these are, on the whole, decidedly less satisfactory cases

Improvement or amelioration of the retinal lesions is not to be looked for ; it may occur, but that is rare. It has even happened that the fœtus has died, and that, consequent on that occurrence, the retinal lesions have gradually faded away. As a general rule, however, when pregnancy has ceased, improvement has set in and the retina has cleared up, and the only unfavourable cases are those in which optic atrophy has come on, and those in which the patient lost her life from the severity of the intoxication. Statistics clearly bring out that as regards both life and sight the induction of premature labour is the best line of treatment.

Naturally the question as to the permission of any future pregnancy is a very grave one. The author's view is that after the most favourable recovery there ought to be an interval of not less than two years —if, indeed, the risk may even then be run.

SCOTOPIA.

That when we come out of a brightly-lighted room into a dark evening we can hardly see anything whatever, and require a little time before being able to find any landmarks, but that after a short time objects begin to take shape and be differentiated from one another,

is one of the commonest of experiences. Further, that with some persons, apart from any pathological condition of the eye, this dark adaptation (scotopia) is slower of development and less complete than with others is quite well known, while in certain abnormal states of the eye it hardly can be said to occur at all. We call these people night blind. This normal adaptation for (relative) darkness is a slow process, and is characterised by a rise in the sensitiveness of the retina to light, which is slow during the first ten minutes of exclusion of light, then rapid for some twenty to thirty minutes, after that it is again very slow, if indeed it goes on at all. A curious point comes out in this connection, fairly well known to those who have worked at the subject, but somewhat astonishing to those whose attention has not been specially directed to it. It is this :—For hundreds or perhaps thousands of years it has been known that though the fovea is the spot of much most acute form-vision, it is by no means the point of most acute light perception. This has been shown to be a fact familiar to the astronomers of very early times, for they were aware that when the luminosity ("magnitude" in astronomical phrase) of a star was so low as to lie on the threshold of visibility, it might not be visible when viewed directly, but would come into view if the gaze were directed to a point in the sky somewhat "off" the precise known situation of the particular star. The Pleiades are said to offer a striking example in point. View them directly and four, or at most five, stars are clearly visible, but on indirect vision several others come within the limits of perception.

Without going into details it is sufficient to note that the fovea is a region of physiological night-blindness. Parsons, in whose interesting paper on "Scotopia" (*Rep. Royal Lond. Ophth. Hosp.*, xxviii. 3) these facts are mentioned, does not think it necessary to draw attention in it (for reasons which are not germane to our present purpose) to a fact which has often been observed in this connection, namely, that a person in the custom of wearing spectacles when walking, will often remove them when out in the evening or in the dark. His reason for this conduct, which at the first blush appears singular, is this, that the glasses absorb a certain small amount of light, and in the state of very feeble illumination every ray is valuable ; and, further, glasses help to form an image on the macula but nowhere else, and in conditions of lighting in which the macula is of no value a person employs his peripheral vision entirely and this is not assisted by lenses at all. Some persons, especially those with an exaggerated degree of normal night blindness, notoriously do not look at obstacles in the half dark, because the more they look (that is, the more strictly the *macula* is employed) the less they see.

In the condition of dark adaptation or scotopia, if it be fairly complete, colour-blindness, almost total in degree, comes to exist, and a

curious alteration of the normal spectrum at the same time occurs, for the band of highest luminosity in this colourless spectrum is shifted from the yellow region further towards the violet end, while the red end is somewhat shortened. Now the interesting point in that is that just exactly these conditions are found to obtain in persons afflicted with complete achromatopsia : their luminosity curve practically co-incides with that found in dark adaptation. It has been known ever since the days of Purkinje (and, in a sense, long before then) that as light failed the reds became darker, and the red end of the spectrum was shortened, but the violets and blues are relatively brighter : indeed the brightness of the blues increases much more rapidly than does that of the reds diminish.

It is simple enough, dealing with the peripheral parts of the field of vision, to show that there is a limit of visibility for light and a different limit for colour, and the same is true, though not to an equal degree, for all parts : that is to say, if a ray of coloured light sufficiently feeble in intensity is allowed to fall upon the retina, it may excite sensation of light alone, and it must be more intense if it is to rouse the colour sensation. Expressed in more scientific terms, there is an absolute threshold and a colour (or specific) threshold of vision, and the interval between them is spoken of as the "colourless interval." This colourless interval is greater the more complete is the dark adaptation ; and this is due more to the lowering of the absolute threshold than to any change in the specific. The colourless interval is not the same for all rays, but is greater for those of short wave length and less for those whose wave length is longer. This has a decided influence in regard to what is spoken of as "picking up lights" in this way. The eye is deeply dark-adapted, let us say, and therefore the night-blind fovea may fail to be conscious of a feeble white light which is yet quite visible to more peripheral parts of the retina. If the light be green and is visible to the fovea it will appear definitely green, but if feebler it may be visible only in the paracentral portions, and its colour may not then be decipherable at all. A red light, being invisible if below a certain limit of brightness to the peripheral retina, may not be readily picked up at all, but if capable of stimulating the more central parts of the retina will be definitely red, without any element of uncertainty, as there may readily be in the case of green.

These differences of visual reaction, according as the adaptation is for light or for dark, very briefly indicated above, suggest that there may be two sets of end organs, which are alternatively more active, and at once the fact of the existence of rods and cones in the retina springs to one's mind. Further, the entire absence of rods at the fovea is very suggestive. V. Kries puts forward now a definite theory as to the functions of the rods and the cones, in which he regards the rods as the organ of scotopic vision, the cones of photopic. The rods are

susceptible of very marked alterations of adaptation in which colour-free sensations of light are excited, while the cones are susceptible only of slight alterations in adaptation ; they are colour sensitive, and their reactions vary with the photopic luminosity curve. It seems probable from the arguments produced that the rods have to do with the perception of light as such, the cones rather with the interpretation of colour and of form. W. G. S.

PATHOLOGY.

UNDER THE CHARGE OF

THEODORE SHENNAN, M.D., AND JAMES MILLER, M.D.

COMPLEMENT-FIXATION IN TUBERCULOSIS.

THE discovery that an "antigen" (a substance used for immunisation) in the presence of its specific antibody (serum of animal immunised) will "bind," "deviate," or "fix" complement is the outcome of the researches of Pfeiffer, Metchnikoff, Bordet, and Gengou. This phenomenon, often known as the Bordet-Gengou phenomenon, is one which has been most fruitful in results, both practical and theoretical. Thus it is useful in the recognition of the presence of an antigen in the detection of blood in medico-legal cases, but it is most usually employed in the recognition of specific antibodies in sera in the diagnosis of disease. The Wassermann reaction used in the diagnosis of syphilitic disease is the most generally known application of the phenomenon, but it has also been employed in typhoid and other microbic affections.

The exact significance of a positive Wassermann reaction is not yet known, but in other diseases such as typhoid a positive complement-deviation experiment means that specific antibodies are being produced in response to the presence of active microbes and are flowing over into the serum. The positive reaction indicated, theoretically at any rate, the presence of active disease.

Now, from the mere fact that tuberculosis is a microbic infection, but more especially because of the close analogy between tuberculosis and syphilis in many respects, one would have imagined that specific antibodies would be found in the serum of cases of active tuberculous disease. Had this proved to be the case the complement deviation test would have taken its place as a most important diagnostic and prognostic method. A résumé of the work done in this connection during the last 10 years should give us some interesting information

In May 1901, Bordet and Gengou published their method for demonstrating the presence of antibodies in sera by deviation of complement. In July of the same year Widal and le Sourd published the first results with the method as applied to tuberculosis. They obtained deviation of complement in certain cases of tuberculosis, using as antigen

homogeneous emulsions of tubercle bacilli of the Arloing-Courmont strain. Bordet and Gengou (1903), also using an emulsion of bacilli as antigen, obtained deviation of complement with the serum of guinea-pigs inoculated with tubercle bacilli. It was not, however, until 1906 that any considerable series of cases was studied in relation to this question by Wassermann and Brück.

These authors employed the method used by Wassermann in his syphilis reaction, with, of course, this difference, that instead of a syphilitic antigen a tubercle antigen was used. For this purpose they employed either Koch's old tuberculin or the more recently introduced "bacillus emulsion." One of these, to the amount of 0·1 c.c., was introduced into a tube with 0·05 c.c. of the serum to be tested, and with 0·1 c.c. of fresh guinea-pig's serum (*i.e.*, complement). These were mixed and incubated together for one hour. At the end of that time the serum of a rabbit previously treated with sheep's red blood corpuscles and inactivated (*i.e.*, red blood cell immune body) was added in an amount twice as much as was necessary for production of hæmolysis (*i.e.*, twice the minimum hæmolytic dose), along with 1 c.c. of sheep's red blood corpuscles (5 per cent.). The whole was again mixed and incubated for 1 to 2 hours at 37° C. At the end of that time the result was read and the tubes placed on ice to be read again next morning.

Experimenting in this way Wassermann and Brück found no evidence of specific antibodies in the serum of 13 cases of tuberculosis not treated with tuberculin. On the other hand, in 11 cases of tuberculosis treated with tuberculin, evidence of the presence of anti-bodies in the serum was found. Further, the development of these antibodies was demonstrated in a case the serum of which was at first negative, but which later, under treatment with tuberculin, became positive.

The same authors in another series of experiments demonstrated the presence of an antibody (antituberculin as they called it) in extracts of pounded-up tuberculous tissues. By varying the experiment, *i.e.*, by omitting the tuberculin and using instead a deviating serum, it was shown that extracts of tuberculous organs also contained tuberculin in a demonstrable quantity. From these facts the authors deduced certain interesting theoretical considerations. The softening and breaking down of tuberculous tissue when a tuberculous animal or individual is treated with doses of tuberculin had long been recognised. Two explana-tions of this phenomenon had been up to that time suggested—one by Koch, that the tubercle poison (tuberculin) introduced adds itself to that already present in the tuberculous tissue, thus producing a summation effect, the other that the tuberculous organism is hypersensitive to the tubercle poison. Wassermann and Brück suggested that the softening was caused by the union of antituberculin in the tissue and

the tuberculin introduced by inoculation and the consequent concentration of complement at that point. In this way albuminous substances present in the part undergo softening, partly from the digestive action of leucocytes, partly owing to the setting free of substances derived from them along with complement. In cases where antituberculin is present in the circulating blood there is no reaction to tuberculin, because much of the latter is neutralised before it can reach tuberculous tissue.

These results were confirmed in the main by Weil and Nakajama (1906), using Wassermann's methods. They failed, however, to demonstrate the presence of antituberculin in tuberculous tissue ; they also differed from Wassermann and Brück in ascribing the softening of tuberculous tissue under treatment with tuberculin to a summation of poison, and not to determination of complement to the part owing to the union of tuberculin and antituberculin.

In a later paper Wassermann and Brück reported the results of the investigation of a further series of experiments in which they were able to demonstrate antituberculin in some cases of tuberculosis not treated with tuberculin. The authors stated their belief that the phenomenon was to be observed in a certain stage of the disease.

Citron (1907), using Wassermann's method in 9 untreated cases of tuberculosis, obtained 2 positive and 7 negative results : in 14 treated cases, 8 positive and 6 negative results. He supported Wassermann's theoretical views regarding the importance of the fixation of complement *in vivo*.

Lüdke (1908) found antituberculin present in tuberculous tissue in man in three out of five cases. He found it in the serum in 17 out of 31 treated cases and in two (advanced cases) out of 10 untreated cases. In 18 cases, none of which were tuberculous, a negative result was present each time. The author made the observation that antituberculin was present more especially in cases where the administration of tuberculin was not followed by reaction. Where a marked reaction was present there was never any fixation. In 8 cases tested both before and after administration of tuberculin, antibodies were found after injection in seven. In three cases of disease other than tuberculosis the injection of tuberculin was not followed by the appearance of antituberculin.

Christian and Rosenblat (1908), following Wassermann's method, and using "bacillus emulsion" tuberculin as antigen, note that the serum of normal rabbits usually gives a positive, that of oxen and sheep almost always a positive, while that of swine and goats only exceptionally a positive, reaction. This demonstration of what appear to be tubercle antibodies in the serum of normal animals is particularly interesting. The authors further observed that rabbits which under normal conditions gave a negative reaction did not give a positive one

on being inoculated with tuberculosis. On the other hand, those which gave a positive reaction under normal circumstances lost the reaction on being inoculated. They also noted that guinea-pigs never gave the reaction normally, but tuberculous guinea-pigs when treated with tuberculin developed a positive reaction. If, however, in such animals any glands which were tuberculous were excised, treatment with tuberculin did not result in the development of antibodies in the serum.

Engel and Bauer (1908), investigating a series of tuberculous conditions in children, found specific antibodies neither in the serum of healthy nor in that of infected cases ; but in all cases of tuberculosis specifically treated antibodies developed. Further, the antibodies increased in amount with the dose of tuberculin and dropped on discontinuing the treatment.

Loewenstein (1909), using " old " and " new " tuberculin as antigen, found antibodies present in a high percentage of tuberculous individuals who had been ill for years. On the other hand, in cases of fresh infection they were almost always absent. In cases treated with tuberculin they usually disappear for a short time to reappear again about the eighth day after the injection, and subsequently increase.

Rüppel (1910) notes a marked rise in the amount of antibody in the sera of bovines inoculated with human tubercle bacilli and treated with tuberculin.

Nesfield (1910), using an emulsion of tubercle bacilli in normal saline as antigen, normal human serum for both immune body and complement and the red blood corpuscles of the sheep, found positive results in all cases of tuberculous disease and in no single case of non-tuberculous disease.

D'Este Emery (1911), using a sterile bacillary emulsion as antigen, the complement present in the serum to be tested, and human red blood corpuscles, also a special technique by varying the time during which ingredients remain together at 38° C., obtains 82 per cent. of positive reactions in 56 cases of tuberculosis and 17·6 per cent. of positive reactions in 34 non-tuberculous cases.

Porter (1911), investigating the serum of cattle, found complement-fixation in normal as well as in tuberculous cases, the reaction being more characteristic of advanced than of early disease. Wyschelescky (1912), also working with cattle, confirms these results. Both observers conclude, however, that the method by itself is quite useless as a means of diagnosing active as distinct from quiescent tuberculosis.

Deilmann (1911) compares various extracts from tubercle bacilli ((1) the proteins, (2) the fatty acids, (3) tuberculo-nastin) among themselves and each in turn with tuberculin as antigens, and concludes that all the extracts act as antigens, but none are so strong in this respect as an emulsion of the whole bacillus or as tuberculin.

Calmette and Massol, also Letulle (1912), using as antigens (1) watery extracts of bovine tubercle bacilli, and (2) bacilli macerated in peptone, and employing a more extended technique by adding varying doses of complement, have found antibodies in demonstrable quantities in a large percentage of tuberculous cases (89·5). They consider that the reason why antibodies are not invariably present is that in many cases a substance is present in the serum which "inhibits" the reaction. They have found the most marked reactions in cases of slowly progressive disease. In cases of rapidly progressive disease, on the other hand, the result is more often negative. They have succeeded in producing sera very rich in specific antibodies by injecting horses and cattle with bacillary extracts.

Hammer (1912), using a mixture of extract of tuberculous synovial membrane and tuberculin as antigen, obtained positive results in over 90 per cent. of cases of tuberculous disease.

From the foregoing it will be seen that the expectations regarding the usefulness of the complement-deviation test in tuberculous disease have so far not been realised. At the same time one cannot help noting that the work done by some observers has been contradicted by others. This may be due to the fact that methods have varied considerably, but one cannot help thinking that some of the work is not entirely reliable. Were it the case that antibodies did not develop and pass over into the serum in tuberculous disease the fact would be sufficiently remarkable. It is possible, on the other hand, that negative results may be due to the want of a sufficiently sensitive antigen. In any case the fact is patent that at present the method cannot occupy the same position in the diagnosis and prognosis of tuberculous disease as the Wassermann reaction holds in the diagnosis and prognosis of syphilis.   J. M.

NEW BOOKS.

Life of Sir William Tennant Gairdner, K.C.B., M.D., LL.D., F.R.S., with a Selection of his Papers. By Dr. GEORGE A. GIBSON. Glasgow: James Maclehose & Sons. 1912.

THIS is a volume of supreme and unique interest to the profession. It tells of the life, work, and opinions of one of the most original and thoughtful physicians of modern times. It consists of three parts – (1) Biographical Sketch; (2) Papers on General Subjects; and (3) Papers on Medical Subjects. All of these constitute delightful reading, and afford evidence of a well-stored and philosophical mind, a tenacious memory, and an affectionate heart.

It would have been little less than calamitous if these contributions had been unpublished collectively, and thus, in some measure, consigned to neglect or oblivion.

In Professor Gairdner's writings it is noteworthy that he always contrived to be fresh and *au courant* with the events and latest thoughts of his time, and yet could call upon his stores of reading and his knowledge of men and manners so as to give point to any matter he set his pen to. There was an eternal youth about him.

The volume all through exhibits "Gairdner" (as his old pupils and friends can only think of him) exactly as we knew him in daily life—a rare personality, like and akin to none other we ever met with or can expect to encounter again.

We note first the elaborate biographical sketch illustrating his descent and parentage. Next, we have his school and college life, his career as a hospital pathologist and clinical teacher in Edinburgh, and his attainment of the Regius Chair of Medicine in Glasgow, with his associated duty in the Royal Infirmary, all set forth. In this section we find the professor's views on medicine and science, his ecclesiastical and political opinions, and his conceptions of theology, churches, and religion. These are very remarkable chapters, and are well worthy of serious study from other than medical readers. They deserve the attention of all thoughtful and serious persons. When the honest and widely-trained *mens medica* is set to consider the problems of theology and politics we may fairly expect these subjects to be treated with gravity and independence, and far apart from the miserable atmosphere of parties and prejudice. Such was Gairdner's instinctive method of dealing with such matters, a method always based on a pure and simple Christian faith. None can regard them from a firmer standpoint than that.

The chapter on personal character is, as may be imagined, one of delightful reading.

In the studies on general subjects we meet with treasures which should interest the present and many future generations of students in medicine. Old Edinburgh *alumni* will find in them a fund and a revival of happy and cherished memories.

The two keynotes of Gairdner's method of clinical instruction were *discipline* and *thoroughness*. On these topics we find two chapters of the greatest interest for students. His touching tribute to the life and character of Dr. Warburton Begbie shows well the manner of man he was to all his colleagues, ever loyal, affectionate, and appreciative of all that was good in them.

The large number of letters on all varieties of topics constitute a sort of running diary of the events in this full life, and indicate how Gairdner kept in touch with many of the best workers and thinkers of his time (Dr. Gibson has done well to have secured so many of these). Little, indeed, escaped his keen perception of things in a busy world, and he delivered himself on most of them.

The account of his visit to America is full of interesting matter.

He met many leading persons in the course of his travels, and wrote his impressions of the country and the American people with particular care and deliberation for the benefit of his children.

He was always an intelligent traveller in many parts of Europe. Little of importance in all directions escaped his shrewdness and scrutiny. His outlook was larger than that of most men, and we have known few men endowed with more common sense and level-headedness in all the ways of life.

And surely what a *human* philosopher he was! "*Nihil tetigit, quod non ornavit*," is most true of him. He always went straight to the root or bedrock of everything, and viewed all around before he declared his mind on any matter. In respect of education he maintained that it should always aim at drawing out the mental and moral qualities of the individual.

The purely medical papers now republished in this volume are no less than classical contributions to our art, and have placed Gairdner's fame as an original observer and thinker on a high pedestal. Those relating to renal pathology, bronchitis, aneurysms, dilated heart, and cardiac murmurs are now for the first time placed collectively before the profession. The discovery of mitral stenosis is well set before us. The last paper he ever wrote was on the subject of percussion, and it is as clear and suggestive as any of his earlier contributions.

Gairdner was a prolific writer. A full bibliography is appended, his literary efforts extending from 1848 to 1904. They were truly *verba magistri*, and display vast industry and a revelation of his remarkable power as a teacher, physician, and sanitarian. Several excellent portraits adorn the volume, and recall the well-known face and head, which vividly expressed both vigour and sweetness. The biographer has done his part to perfection, and he was clearly, all through, in full sympathy with his subject. It was no light task to set forth this outstanding life and character in a worthy manner. Dr. Gibson's labour was surely blended with love and devotion, and we have the fruits of it in a volume which should find a place in every medical library. It enshrines a fine testimony to one of the noblest and most faithful of our British physicians. *Exstinctus amabitur idem.*

For and Against Experiments on Animals. By STEPHEN PAGET, F.R.C.S. Introduction by Lord CROMER. Pp. 344. London: H. K. Lewis. 1912. Price 3s. 6d. net.

IN this volume, which is published at the request of the Committee of the Research Defence Society, Dr. Stephen Paget has condensed the evidence for and against vivisection given by witnesses called before the recent Royal Commission on the subject.

That the greater part of the book is occupied with the case for the utility of animal experimentation necessarily follows from the meagre

ness of the case which can be made out on the other side. Notwith-
standing this, it will, we think, be generally recognised that the
arguments put forward by the anti-vivisectionist party have been
fairly set forth. Of especial value is the summary of the evidence
given by Lord Justice Fletcher Moulton, whose treatment of the
subject from the standpoint of a judge on the bench constitutes one of
the most weighty contributions to the controversy which has ever
seen light. It is generally felt that the Research Defence Society has
been doing most valuable work in enlightening the reasonable section
of public opinion, and Dr. Stephen Paget is to be congratulated on the
part which his volume must inevitably play in this process. The book
will be a powerful weapon in the hands of those whose business it is
to educate the public with regard to the necessity for animal experi-
mentation in advancing knowledge and in mitigating human suffering.

Experimental Physiology. By E. A. SCHAFER, F.R.S. Pp. 111.
    London: Longmans, Green & Co. 1912. Price 4s. 6d.
THE present volume is a development of the author's well-known
Directions for Class-Work in Practical Physiology. More than one-third
of the book is devoted to nerve-muscle experiments. The remaining
pages give succinct directions for experimental observations on the
circulation, respiration, central nervous system, and special senses.
There will probably be differences of opinion as to how much of the
subject-matter is suitable pabulum for students of medicine, but there
can be no doubt about the excellence of its presentment.

Diseases of the Throat, Nose, and Ear; for Practitioners and Students.
    By W. G. PORTER, M.B., B.Sc., F.R.C.S.(Edin.), Surgeon to
    the Eye, Ear, and Throat Infirmary, Edinburgh, etc. Bristol:
    John Wright & Sons, Ltd. 1912.
DURING the last few years a number of text-books dealing with
diseases of the ear, nose, and throat have been published, some in our
own language, others in French and German. These volumes as a
rule deal at length with the affections of the ear or of the nose or the
throat and larynx, so that it becomes necessary for the student to
purchase two, or even three, volumes if he desires to obtain a general
knowledge of the diseases of the upper air-passages. Notwithstanding
the excellence of these text-books we have long felt the want of a
single volume of moderate dimensions which would cover all the
ground, and which we could thoroughly recommend to the favourable
notice of the student of medicine and the general practitioner—a book
that would give them a good general and practical knowledge of the
subject.

    This want has now been supplied in the volume before us, and we
heartily congratulate Dr. Porter, not only in filling the void but in

having done so in such an excellent and readable form. In reviewing his book we must not lose sight of the main idea which he had before him in writing it, namely, to give the reader sufficient information on the diseases of the throat, nose, and ear to be of value to him in general practice. We are of the opinion that the author has succeeded in doing so. The book is eminently practical. The ordinary methods of examining the upper air-passages, the performance of which can be acquired without elaborate apparatus, are clearly described, while the more complicated methods are merely referred to. The same idea is kept up in connection with treatment, where he deals at length with the commoner affections and leaves alone the details of operative interference such as must necessarily be undertaken by the specialist.

In connection with treatment we would like to have seen him draw special attention to the necessity of recommending a mastoid operation in those cases of acute middle ear suppuration which fail to respond to simple treatment after a limited period of time, so that a chronic suppuration may in this way be prevented. This has always seemed to us to be a very important point to emphasise with the practitioner in charge of these cases, because the matter rests with him as a rule and not with the specialist, who may only see the patient on one or two occasions.

We commend Dr. Porter's wisdom in refraining from illustrating his book with a variety of instruments. The diagrams and coloured illustrations, and we specially draw attention to the latter, are excellent, and they have the further merit of being original and not copies of the work of others.

We feel sure that the volume will be much appreciated by those for whom it has been written.

The Extraction of Teeth. By J. H. Gibbs, F.R.C.S., L.D.S (Edin), Dental Surgeon, Edinburgh Royal Infirmary. Pp. 158. Edinburgh: E. & S. Livingstone. 1912. Price 7s. 6d.

This is the most practical and complete work that has so far been published upon the extraction of teeth. The author is, as he candidly confesses in the preface, quite heterodox in his views, and those who are in the habit of using a large and varied assortment of forceps will at first be somewhat taken aback by his advocacy of but two pairs of forceps for the extraction of all the teeth, but he gives his reasons for all that he teaches, and they are very convincing.

The book is the outcome of a very large and varied experience, and its value is greatly enhanced by the clinical cases which are recorded, and which give it an importance from a medico-legal point of view.

Most general practitioners, especially in the country, are compelled at times to extract teeth, and if they follow the technique advocated

in these pages they will find that this much-dreaded and somewhat uncertain operation becomes a comparatively simple and certain one.

The author is to be congratulated upon producing a book which should be of the greatest value to those who have not had the advantage of his personal teaching.

The publishers have done their part well, for although there are a few misprints, the type is clear, and the illustrations, most of which are from photographs, have been beautifully executed.

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The Practical Medicine Series. (Chicago, the Year-Book Publishers, 1912, price $2). *Surgery.*—There is no more useful résumé of the year's work in surgery than that furnished annually by Dr. J. B. Murphy in the Practical Medicine Series. The editor's outstanding position among American surgeons is sufficient warrant that the papers selected for notice are of permanent value, and his editorial comments are often most illuminating. In a short introduction we have a masterly summary of the present trend of surgical work—the lines along which advances are being made, the position reached, and the direction in which further investigation must be carried. We again commend the work to the notice of practitioners and surgeons.

Eye, Ear, Nose, and Throat.—The present volume, edited by C. A. Wood, A. H. Andrews, and G. P. Head (price $1.50), is published primarily for the general practitioner, but the arrangement in volumes enables those interested in special subjects to buy only the parts they desire. This volume consists of abstracts of papers which appeared during 1911, the first section dealing with the eye, the second section with the ear, and the third with the nose and throat. The selection of papers has been judicious on the whole, and the book should prove of value to those who cannot find time to keep themselves up to date by reading the special journals on these subjects.

General Medicine is one of the best retrospects issued. Medicine is edited by Dr. Frank Billings and Dr. J. H. Salisbury, both of whom deserve the thanks of all who wish a succinct account of the advance of medicine during the past year.

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In *Diseases of the Nervous System* (Manchester, at the University Press, price 15s.) Dr. Judson Bury has succeeded in the difficult task of writing a text-book of moderate dimensions which is concise and at the same time eminently readable. Chapters dealing with anatomical, physiological, etiological, and pathological questions, and with the clinical manifestations of nervous disease, precede the systematic consideration of the individual disorders. The descriptions of the various diseases are excellent, and the subject-matter throughout is up to date. The book may be confidently recommended to students and practitioners.

Dr. Julius Citron's book on *Immunity: Methods of Diagnosis and Therapy and their Practical Application:* translated from the German and edited by A. L. Garbat, M.D. (P. Blakiston's Son & Co., price $3.00 net), is now made available for English readers, and will be welcomed, as it fills a special place in the literature of immunity. The special character of the work consists in the descriptions which it gives of the actual methods by which the various types of immunity are produced, and these descriptions are all the more valuable in that in each case actual examples with full details of the procedures are set forth. The sections dealing with the use of the tuberculins in the treatment of tuberculous infections and with the Wassermann procedures for the diagnosis of syphilis are of special merit, though a defect in the latter is that the work of British bacteriologists is not even mentioned. The book is of handy size, and it can be thoroughly recommended.

NEW EDITIONS.

The Principles and Practice of Medicine. By Sir WILLIAM OSLER, Bart., M.D., F.R.S. Eighth edition, largely rewritten and thoroughly revised with the assistance of THOMAS M'CRAE, M.D. Pp. 1225. London: D. Appleton & Co. 1912. Price 21s. net.

A TEXT-BOOK which has reached its eighth edition rarely demands a lengthy review, for it has won its position and does not require extraneous praise. But in the case of the present volume so many changes have been made and so much new matter has been introduced that it is necessary to direct attention to these improvements. The general plan of the book remains the same, and it has only grown in bulk by some 82 pages since the last edition appeared, but we are impressed by the thoroughness with which antiquated material has been excised, and the skill with which newer information has been inserted without giving the impression of patchwork. In some parts of the book, such, for example, as those sections which deal with infectious and parasitic diseases, there has been a complete rearrangement of the chapters themselves as well as the insertion in them of many new points in etiology and therapeutics. Special attention may be called in this respect to the paragraphs on the treatment of cerebro spinal fever, on the use of salvarsan in specific disease, and on the etiology of acute poliomyelitis.

The same thorough revision is conspicuous in the other portions of the book; and the sections dealing with diabetes mellitus and the disorders of carbohydrate metabolism, with the diseases of the ductless glands and their effects on the general economy of the body, and with the questions relating to immunisation, all bear the mark of thorough knowledge of the recent advances which have been so rapidly made. In the section relating to the diseases of the circulatory system a

tribute is paid to the studies of recent workers by a rearrangement which places the so-called functional affections of the heart and the diseases of the myocardium before those of the endocardium instead of after them as in former editions; but in spite of the introduction of new material, the reconstruction has perhaps been less successful than in the cases already instanced, and the new ideas are less satisfactorily blended with the older ones. Taken all round, the text-book is one of the best which can be placed in the hands of the average student, while it will prove equally serviceable to the older physician who wishes to keep in touch with the most important advances in every branch of his subject.

Anæsthetics and their Administration. By Sir FREDERIC HEWITT, M.V.O., M.D., assisted by HENRY ROBINSON, M.D. Fourth Edition. Pp. 676. London: Macmillan & Co. Price 15s. net.

THE great changes in the theory and practice of anæsthesia in the last few years have necessitated a new edition of this well-known book. The physiological part has been thoroughly revised and brought up to date, and stands as the best exposition of the subject in the English language. Two new chapters have been introduced—one upon the medico-legal aspects of anæsthesia, and one upon local, regional, and spinal methods. Upon some of the newer developments, such as intravenous and intratracheal anæsthesia, and nitrous oxide and oxygen in major surgery, the author writes with great reserve, preferring, apparently, to reserve his judgment. This attitude, while no doubt in the main wise, seems to us to be carried to slight excess. In every other respect the book is admirable.

In this the fourth edition of *Wheeler's Handbook of Medicine* (Livingstone, 1912, price 8s.), brought up to date by Dr. Jack, little remains of the first published eight years ago. Sections on intoxications, tropical diseases, immunity, and other subjects have been added, thus making the text-book a trustworthy, compact, and altogether excellent one.

Elements of Practical Medicine. By A. H. CARTER, M D., M.Sc. Tenth Edition. Pp. 683. London: H. K. Lewis. 1912. Price 9s.

THE popularity amongst students of Professor Carter's manual is evidenced by the appearance of a tenth edition. The treatment of the different subjects is perhaps a little unequal, some appearing to suffer from over-condensation. The information given is, however, clearly put and up to date in character. Therapeutic measures are discussed briefly and somewhat dogmatically, but in a manner suited to

the student, who will gain from the book a useful introduction to the study of medicine.

Surgical After-Treatment. By L. R. G. Crandon, A.M., M.D., and Albert Ehrenfried, A.B., M.D., Harvard Medical School. Second Edition. Pp. 831. With 265 Illustrations. Philadelphia : W. B. Saunders Co. 1912. Price 25s. net.

WE expressed a favourable opinion of this work when it appeared less than two years ago, and the second edition, which is now before us, in no way falls short of its predecessor. If we were to offer any criticism of the new issue it would be that, while the authors describe in sufficient detail the ordinary after-treatment of a plain-sailing case, they frequently fail us when we consult them regarding the steps to be taken when complications have arisen and things are not going smoothly.

NOTES ON BOOKS.

A Practical Medical Dictionary, by Thomas Lathrop Stedman, A.M., M.D. (Henry Frowde and Hodder & Stoughton, 1911, price 21s.).— It is impossible in the limited space at our disposal to give anything approaching a complete account of the comprehensiveness of this work. In the fifty thousand titles are included, in addition to medical words proper, dental, veterinary, chemical, botanical, electrical, and life insurance terms. The labour involved in the preparation of the *Dictionary* must necessarily have been stupendous and spread over a number of years, but neither time nor trouble has been spared in the effort to make it worthy of the name. The difficulties of synonyms, of alternative spellings, and of cross-references have been on the whole successfully overcome. In comprehensiveness and general handiness the volume constitutes the "last word" in medical dictionaries.

For the first time in its history *The Extra Pharmacopœia* of Martindale and Westcott (15th edition : London, H. K. Lewis) appears in two volumes, this change having become necessary on account of the growth of the subject matter during the past two years. Volume I. deals, roughly, with therapeutic questions, Vol. II. with analytical and experimental work, both in reference to medicinal substances and clinical investigation. It is quite unnecessary for us to praise the way in which the *Extra Pharmacopœia* has been revised; its value as a mine of reference is too well attested to require further emphasis. The division into two volumes will, no doubt, be regretted by some, but we think that it is a decided improvement. The subjects now relegated to the second volume are daily bulking more largely in importance, and from many points of view it is well that they should be separated from the more purely therapeutic part of the book. The volumes cost 14s. and 7s. respectively, and may be purchased separately.

In his preface to *Children: Their Care and Management* (Henry Frowde and Hodder & Stoughton, 1912, price 3s. 6d.), Dr. E. M. Brockbank says that "the object of his book is to offer to newly-qualified doctors and to mothers and nurses some practical advice on the everyday care of children at the nursery age." He need not in this book limit his remarks to newly-qualified doctors; some of the chapters, more especially the first one, on "natural or breast feeding," might be read with advantage by all general practitioners. In such a book as this, covering so much ground, and written also more or less in a popular manner, adverse criticism could no doubt be given; but we feel that the book is written on eminently safe and sound lines, and we can thus confidently recommend it, as giving much useful and practical advice on an all-important subject.

Modern Methods in Nursing, by Georgiana J. Sanders (W. B. Saunders Co, price 12s.), forms a complete guide for a nurse, from the time when she begins to select a training-school till she has charge of a ward. The perusal of Miss Sanders's manual gives a good idea of the fulness of the present-day curriculum. The book is not a mere compilation of facts from various text-books, but has obviously been written by one with a large experience in nursing. It gives us pleasure to recommend it.

Dr. Duckworth's *Prehistoric Man* (Cambridge University Press, 1912, 1s. net) provides a succinct account of the earliest phases of the history of mankind. No better introduction to this subject could be desired. The latest evidence on the subject is ably summarised, and the value of the book is enhanced by well-selected illustrations and a list of references. The high standard of the Cambridge manuals is worthily maintained in this volume.

Golden Rules of Skin Practice (4th edition), by David Walsh, M.D. (John Wright & Sons, Ltd., price 1s.), is a useful little book for car or carriage moments. The teaching is well in line with modern research, and as reliable as possible in this condensed form. The alphabetical arrangement is useful for ready reference.

Systematic Case-Taking, by Henry Lawrence M'Kisack, M.D., M.R.C.P.(Lond.) (Baillière, Tindall & Cox, price 3s. 6d.), contains nine short chapters in which the examination of medical cases is briefly described. The book is an amplification of the ordinary case-taking form, and from this point of view is a good introduction to the ordinary text-books on clinical methods. Its chief value to the student, however, is the fact that the conclusions which may be drawn from clinical data are shortly stated. Some of the descriptions are too short to be easily understood by a junior student, and this is specially so in the chapter on the blood. In dealing with the nervous system the author states briefly the conclusions to be drawn from physical signs, and explains the meaning of many terms used in neurology.

A handy text-book wherewith to refresh the memory as to the anatomy or physiology of the nervous system is as useful to the practitioner as to the student preparing for an examination. Dr. Lickley's *The Nervous System* (Longmans, Green & Co., 6s. net) is an excellent manual of this type. It is copiously illustrated, and the only criticism we would pass on it is that Dr. Henry Head's researches on the sensory paths deserve fuller description than they receive.

The Enzyme Treatment of Cancer and its Scientific Basis, by John Beard, D.Sc. (Chatto & Windus), is a collection of papers previously published in such journals as the *Lancet*, *Medical Record*, etc. As such it suffers from the disabilities of similar collections, in that the chief contentions are repeated over and over again. At the same time it contains most interesting and in many ways most instructive reading.

The first edition of Dr. Sim Wallace's little book *The Prevention of Dental Caries* (Offices of the *Dental Record*, price 1s. 6d.) having been sold out within a few months, a second edition has been called for. The views of the author are becoming widely known, and we trust that this edition, which is apparently a reprint of the first but with a much handier size of page, will still further disseminate these views. We recommend the book as a short account of principles which if carried into practice will enormously lessen the amount of dental caries and the diseases that result from it.

The handbook of *Anaesthetics in Dental Surgery*, by Frank Coleman and Harvey Hilliard (H. K. Lewis, price 7s.), is a summary of their own methods in practice and of the conclusions which they have drawn from their experience. Although the publishers have done their part well, the book has every appearance of having been hastily and carelessly written, for not only is there no attempt at literary style, but some of the sentences are ungrammatical and even unintelligible. There are a number of loose and inaccurate statements, and it would be interesting to know on what grounds the authors have come to some of their conclusions. Finally, we strongly dissent from the inclusion of chloroform as a dental anaesthetic, for whatever may have been the justification for its use in the past, there is absolutely none to-day.

Dr. Goepp in *Dental State Board Questions and Answers* (W. B. Saunders Co., 1912, 12s. 6d. net) has collected the questions most commonly asked in the various States and has given answers to them, with the help of collaborators. It is a cram book of the usual type, and as such has no educational value, the information given being scrappy and disconnected.

Hygiene for Health Visitors, School Nurses, and Social Workers, by C. W. Hutt, M.A., B.C.(Cantab.), D.P.H.(Oxon.) (P. S. King & Son, 1912, price 7s. 6d.). This is an excellent practical text-book for all interested in the social welfare and betterment of the poorer classes, and it summarises the required information in a way not hitherto done in any single text-book.

Leitfaden der Praktischen Kriegs-Chirurgie (Dresden, verlag von Theodor Steinkopf, 1912, price M.9.50).—Dr. Walter von Oettingen, who was in charge of a Red Cross field hospital in the Russo-Japanese War, states that he has endeavoured to write the kind of book which was required at that time by himself and his colleagues. His experience has obviously qualified him for the task, and he is to be heartily congratulated on the result.

Mr. C. F. Marshall's book on *Syphilis and Venereal Disease* (Baillière, Tindall & Cox, 1912, price 10s. 6d.) has been brought up to date by the addition to the first edition of chapters on the vaccine treatment of gonorrhea, the micro-biology of syphilis, the Wassermann reaction, and the arsenical treatment of syphilis. Mr. Marshall has presented a good account of recent work on these subjects, and his book may be commended to those in need of an up-to-date moderate-sized text-book treating venereal disease in a systematic manner.

BOOKS RECEIVED.

ALLEN, R. W. Vaccine Therapy . . . . (*H. K. Lewis*) 9s.

ARMSTRONG, H. G., and J. M. FORTESCUE-BRICKDALE. A Manual of Infectious Diseases occurring in Schools . . . . (*Wright & Sons*) 3s.

BORRADAILE, L. A. A Manual of Elementary Zoology . (*Frowde, Hodder & Stoughton*) 10s. 6d.

BOVAIRD, D., JR. Internal Medicine . . . . . . (*J. B. Lippincott*) 21s.

BURY, J. S., and A. RAMSBOTTOM. Clinical Medicine. Third Edition . (*Griffin & Co.*) 17s. 6d.

CAMPBELL, W. F., and LE GRAND KERR. The Surgical Diseases of Children
(*Appleton & Co.*) 25s.

CHAPLIN, A. The Illness and Death of Napoleon Bonaparte . . . (*Hirschfeld Bros.*) 2s. 6d.

CLAYTON-GREENE, W. H. Pye's Surgical Handicraft. Sixth Edition . (*Wright & Sons*) 12s. 6d.

GEIGER, G. Précis Practique d'Électricité Médicale . . . . (*Rousset, Paris*) 6 fr.

GIBSON, G. A. Life of Sir William Tennant Gairdner . . . . (*Maclehose & Sons*) 10s. 6d.

GRASSET, H. Générations Spontanées et l'Hétérogénie . . . . (*Rousset, Paris*) 4 fr.

HERSCHELL, G. Elementary Clinical Pathology for Nurses . . . (*J. & A. Churchill*) 1s.

JONES, E. Papers on Psycho-Analysis . . . . . (*Baillière, Tindall & Cox*) 10s. 6d.

KRAEPELIN, E., and T. JOHNSTONE. Lectures on Clinical Psychiatry. Third Edition
(*Baillière, Tindall & Cox*) 10s. 6d.

LAGLEYZE, P. Du Strabisme . . . . (*Rousset, Paris*) 15 fr.

LEDINGHAM, J. C. G., and J. A. ARKWRIGHT. The Carrier Problem in Infectious Diseases
(*Edward Arnold*) 12s. 6d.

M'CAY, D. The Protein Element in Nutrition . . . . . (*Edward Arnold*) 10s. 6d.

MARCHILDON, J. W. The Wassermann Reaction . . . . (*Henry Kimpton*) 6s. 6d.

MARSHALL, C. D. Diseases of the Eyes . . . . (*Frowde, Hodder & Stoughton*) 10s. 6d.

PERCIVAL, A. S. Geometrical Optics . . . . . (*Longmans, Green & Co.*) 4s. 6d.

PRICE, J. A. P. Hoblyn's Dictionary of Medical Terms. Fifteenth Edition (*Bell & Sons*) 10s. 6d.

RACHFORD, B. K. Diseases of Children . . . . . (*Appleton & Co.*) 25s.

SCHWAEBLE, R. La Vie du Règne Minéral . . . . . (*Rousset, Paris*) 3 fr.

STEPHENSON, S. Ophthalmic Nursing. Third Edition . . (*Scientific Press, Ltd.*) 3s. 6d.

STEVENS, T. G. Diseases of Women . . . . (*Frowde, Hodder & Stoughton*) 15s.

THE Surgical Clinics of John B. Murphy. Vol. I., No. 5, October 1912 (*W. B. Saunders Co.*) —

THE "Wellcome" Photographic Exposure Record and Diary, 1913
(*Burroughs Wellcome & Co.*) 1s.

TURNER, W., and E. R. CARLING. Treatment after Operation (*Frowde, Hodder & Stoughton*) 10s. 6d.

VILLIGER, E. Brain and Spinal Cord . . . . . . (*J. B. Lippincott*) 16s.

WARFIELD, L. M. Arteriosclerosis. Second Edition . . . . (*H. Kimpton*) 10s. 6d.

WHIPHAM, T. R. C. The Medical Diseases of Children . (*Frowde, Hodder & Stoughton*) 10s. 6d.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL NOTES.

WE are deeply indebted to those who, out of the fulness of intimate personal knowledge and familiar friendship, have given expression to the sense of the profound loss which the world of scientific medicine in general, and the Edinburgh medical school in particular, have sustained by the death of Dr. George A. Gibson. We cannot, however, allow the occasion to pass without acknowledging in this column what the passing of Dr. Gibson means to the *Edinburgh Medical Journal*. During a period of considerable stress and strain he directed the policy and maintained the best traditions of the *Journal*, and when that period was passed and he relinquished his editorial duties he remained one of its most staunch and loyal supporters. His long journalistic experience, his outstanding literary gifts, and his widespread influence with contributors in this and other countries were ever at the disposal of his successors, and we gratefully acknowledge the kindly support and guidance we have on many occasions derived from his wise advice.

The Insurance Act. THE medical profession has been signally defeated by the Chancellor of the Exchequer. Defeat was perhaps, as onlookers assert, inevitable, but it has been unexpectedly complete. The unanimous opposition to serve under the Act may have been an expression of the psychology of the crowd, but certainly the stampede which took place after Mr. Lloyd George's speech on 2nd January was a study in the psychology of panic.

No profession has ever come nearer complete shipwreck than ours at this moment. Not merely have the conditions under which at least half its members work been altered, not only has contract practice been extended to an unheard-of degree, but compulsion, the

sheer brute force of economic pressure, has been the weapon which drove a class of men, educated and enjoying certain State privileges, to sell themselves on an employer's terms in just the same way as any proletarian in an over-stocked labour market. That is an injury to its status which Medicine will need all its strength to overcome, and this, it seems to us, is the position to be faced to-day.

The fundamental cause of the break-away was unquestionably fear. To what extent dissatisfaction with the policy of the British Medical Association operated is now merely of academic interest. The Association has certainly not proved what was hoped, and, as events showed, the last move was a tactical error. The Association, for the time being, ceased unequivocally to represent the profession, and many of its members absolved themselves from their pledges in consequence. Frankly, it is a more difficult ethical problem than some seem to suppose to decide in how far a pledge, the efficacy of which depends on its being universally held inviolate, is binding on a minority, or even on a majority, when once enough have departed from it to render it useless for its purpose. Since, however, the Association has now resolved that it is no longer binding, the pledge and the question of its renunciation may be allowed to drop into the background. We cannot leave the matter, however, without saying that highly as we honour the men who, at great loss to themselves, have held to their bond, we cannot find it in our hearts to censure those who were driven to give it up. The most blameworthy are those who did not trouble to vote at the divisional meetings prior to the representative meeting in December : they ought, in justice to their fellows, to have spoken then and elected representatives of the whole Association in fact as well as in name.

Mr. Lloyd George's speech on 2nd January completed the rout : it was a perfect example of the mailed fist—this time in domestic, not foreign, affairs. His carefully laid plans to compel men to serve by the device of the "closed panel," with its possibility of salaried medical officers compulsorily underselling their brethren—a proceeding which the *Spectator* aptly names " a Prussian policy of plantation "—do credit to his astuteness and freedom from scruple, and excite our wonder by their ingenuity : how far they were his own, or in how far he was assisted in weaving the net by the Deputy-Chairman of the Insurance Commissioners, it is interesting, if fruitless, to speculate. No other statesman in modern times has had the cynicism lightly to contemplate inflicting " ruinous loss" on a whole class of the community. In this, as in other respects, Mr. Lloyd George stands unexampled and unapproached. His speech shows that a man may rise to high position without either knowing from experience or understanding through intuition the aspirations of a professional middle class. He seems, however, to realise that he is profoundly distrusted by medical men, or why did he think

it necessary to guarantee on his honour—what? That grievances should have a fair and considered hearing. From anyone else than the Chancellor of the Exchequer this most obvious right of citizenship required no such bombastic security.

Medical benefits are now in operation over the whole country: how far efficiently it is premature to say, since the proportion of panel to non-panel doctors is not yet known. So far as the profession is concerned, the resulting irritation is probably least where the panels are largest, greatest where the panel is small. Edinburgh falls into the latter category, and for the first time we are driven to dwell on the local situation.

That a panel was formed in Edinburgh, which of all cities seemed best able to stand out against service, is, on the face of it, surprising. Yet consideration of the circumstances leads to the conclusion that it was the less of two evils. At the time every other district in Scotland had already furnished its quotum of doctors. The profession here had to choose between an adequate panel and having thrust upon them salaried medical officers — and that in a community which is already not understocked. More than this, these salaried officials were to be encouraged to practise privately, on a fixed tariff, and there was nothing to prevent the local insurance committee from so adjusting their fees as to undersell all the other practitioners in the town. Of those who opposed the formation of a panel some admitted and were prepared to face this risk, others believed that a salaried service was impossible. Which view was right will never now be known with certainty, but there is much reason to suppose that a salaried service could and would have been introduced. It was merely a question of obtaining some fifty doctors, and looking to the numbers who took service elsewhere, it is hardly likely but that the fixed income, together with the educational and other attractions which Edinburgh offers, would have drawn sufficient men, who, after all, were ready to work the Act somewhere—perhaps in less favourable conditions. Further, we know that Mr. Lloyd George was anxious to experiment with a salaried service, and we have it on good authority that the necessary staff was actually at his disposal. He admitted that he wished to plant his henchmen in Bradford, and it is stated, we believe correctly, that Edinburgh was another place on which he had fixed as suitable. Let it be granted that such a service would at first have been unpopular with the insured. The public memory is short, and a new generation arises which readily becomes reconciled to a new order of things. A salaried service once established would have been almost irremovable, and would in the long run have driven out a corresponding number of the practitioners already settled in Edinburgh. Regrettable as was the alternative of forming, under protest, a provisional panel, it could not well be avoided without bringing great hardship on many.

It can not be gainsaid that Edinburgh is now divided into two camps and that the formation of the panel has split the profession. The difference is accentuated in regard to the election of the statutory local medical committee, on which meanwhile quite irreconcilable views are held. In one sense, to form a local medical committee is to help to work the Act : hence many, not all, who refused to join the panel reject it absolutely. Again, a local medical committee has none but advisory powers : it remains to be seen whether it will have any weight with the Insurance Committee. Further, such a committee is not necessary to the panel system. A local medical committee is intended to represent the whole profession, not only the doctors who serve under the Act. It can offer advice on all matters, whether affecting the interests of men outside or on the panel. As examples, the imposition of a wage limit, and permission to insured persons to make their own arrangements, may be cited. The local medical committee is the only means of communication between the medical profession and the insurance authorities. These facts should be carefully weighed in arriving at a decision. If the medical men outside the panel feel that no good can result from their voices being heard on the local medical committee, then, obviously, it will rest solely with those on the panel to elect a committee. Every one agrees that the Act must be amended, and those who are not on the panel have to consider whether they should not supplement outside action against the intolerable conditions of service by statutory agitation within the Act. Undoubtedly a more influential local committee could be formed if it included non-panel representation. If after six months' or a year's trial it was found that their recommendations were passed over, they could prove as a fact, what is now a widely-held opinion, that an amending Act is required to make the committee of any real value. This consideration also must be taken into account.

The shipwreck which threatens the profession is division into two classes. A hundred years ago the village apothecary was the intellectual inferior of the priest and the lawyer, and the social equal of the butler and the lady's-maid—Pendennis, one remembers, was always a little ashamed of his medical ancestry. By unremitting work our profession has raised itself to a position of consideration, and the greatest evil that can befall it is to have to retrace its steps. This danger exists just now, and only an appeal to the bond of common aims, of a common training, of a common outlook on life, can preserve for us and our children our intellectual heritage—Medicine—intact. It is a plain duty to hold and to pass on this great possession unblemished. Many despondingly use the word *débâcle* : but the last sentence of Zola's tale shows us the humble peasant Jean Macquart, *" marchant à l'avenir, à la grande et rude besogne de toute une France à refaire."*

New Year's Honours. THE King has been pleased to confer the honour of knighthood on Robert William Philip, Esq., M.D., F.R.C.P., F.R.S.(Edin.). We offer our sincere congratulations to Dr. Philip on this honour, so well deserved.

We would also congratulate Sir Stewart Stockman, M.R.C.V.S., who for some time was Professor of Pathology at the Royal Veterinary College, Edinburgh, and an active member of the Edinburgh Pathological Club.

SUB TEGMINE GEORGII.

(To D. C.)

My joy it was, of old, in leisure hours,
   Into the garden of high heaven to climb
   With others' aid whose thoughts are wreathed in rhyme,
And there, through them, to pluck poetic flowers.
Or, haply, if Euterpe's magic powers
   Impelled my spirit to a mood sublime,
   Pleasant it was to ring a half-heard chime
Out from some belfry in her secret towers.
Elysian moments now are mine no more.
   Body and soul have both been captive made :
A Tyrant through a hopeless prison door
   Has forced them at the point of his fell blade :
And while, without, the Muse, grave mistress, waits,
Chained to a desk I—sign certificates !

<div align="right">C. J. W. DIXON.</div>

DISCUSSION ON MALINGERING.*

OPENED BY

BYROM BRAMWELL, M.D., F.R.C.P.

MR. PRESIDENT AND GENTLEMEN,—The subject which you have asked me to introduce this evening is of very great interest and practical importance at the present time. It is a large subject of great complexity in which I have always been much interested, for during my first year of practice I was engaged in a big "railway case," and since then I have had a large experience in that kind of practice. Since the introduction of the Workmen's Compensation Act I have had a good deal of experience in compensation cases as medical officer to a large insurance company which deals in this class of business, and in the capacity of Medical Referee for Scotland and as a hospital physician and private practitioner I have seen many cases in which the question of malingering has presented itself.

DEFINITION.—I would define *a malingerer as one who feigns sickness or who deliberately (knowingly and wilfully) induces or protracts an illness, with the object of avoiding duty, claiming money compensation, exciting sympathy, or for any other reason.*

You observe that I use the words "knowingly and wilfully." The term unconscious malingering is sometimes used, but it is an absolutely erroneous one. "Unconscious malingering" is a contradiction in terms; the very essence of malingering is wilful and deliberate (conscious) deceit. It is essential to draw a distinction between *malingering*—conscious and deliberate simulation of disease or exaggeration of symptoms, and *valetudinarianism* — unconscious or subconscious simulation of disease or exaggeration of symptoms.

Until recently malingering was chiefly found amongst soldiers, prisoners, schoolboys, conscripts (in those countries where there is universal military service, the reverse condition being not unfrequently met with in this country amongst young fellows who have passed the Army examinations, but who have been rejected on their "medical"), hospital patients—"hospital birds" as they are termed—hysterical young women, club patients, persons injured or supposed to be injured in railway accidents, and persons who have been accused of some crime, such conditions as epilepsy or insanity being set up as a defence.

All of us who are engaged in hospital practice will, I am sure,

allow that since the Workmen's Compensation Act was introduced * cases of malingering and valetudinarianism have become very much more common. In the last edition of my book on the *Diseases of the Spinal Cord*, published in 1895, I discussed in detail "Concussion of the Spinal Cord," and referred to the injuries which are so common in pitmen as the result of falls of coal or stone on the back. I came to certain conclusions as to the nervous symptoms which these patients manifest. I need not read the whole, but my third and fourth conclusions were as follows:— (3) "That colliers who have suffered from concussion of the spinal cord (I mean, of course, concussion pure and simple) very rarely subsequently suffer from organic disease of the spinal cord or its membranes." (4) "That they very rarely indeed manifest the train of nervous symptoms which so frequently occur after railway accidents and injuries." I then go on to say, "The two last conclusions may in the future be of no small importance, quite irrespective of the subject of railway accidents and injuries, with which we are at present immediately concerned. The tendency of modern legislation is to compensate employees who have been injured, provided that the accident is not the result of their own carelessness or error. Now I venture to predict that if the Legislature should enact that colliers are entitled to compensation for the injuries so received nervous symptoms will in the future be found to result much more frequently from falls of coal and stone on the back than is at present the case."

This prediction has been abundantly verified. My experience during the last five years in the wards of the Edinburgh Royal Infirmary shows that colliers who have been injured in this way very frequently manifest the nervous symptoms characteristic of traumatic neurasthenia or traumatic hysteria. In colliers these nervous symptoms are very much more common than they were five years ago.

Now I venture to predict that when the National Insurance

The Employers' Liability Act came into force on *1st January 1881*. Under it a claim was only sustainable in the event of there being a defect in the condition of the works, or of there being negligence on the part of the employer or those in his service.

The first Workmen's Compensation Act came into operation on *1st July 1898*, and was limited to certain classes of employees. An *amending Act* came into operation on *1st July 1901*, extending the earlier Act to employees engaged in agriculture. *The present Workmen's Compensation Act came into operation on 1st July 1907*, and practically all classes of employees came within its scope.

Act comes into full operation, malingering and valetudinarianism will become very much more common in cases of ordinary sickness and illness (irrespective of accidents and injuries) than in the past, and that these conditions will entail a great increase in the duration of illness, and consequently a great increase in the medical attendance required, and in the expenditure required for sick-pay and allowances during illness.

VARIETIES AND DEGREES OF MALINGERING AND VALETUDIN-ARIANISM.—Various varieties or degrees of malingering may be described.

In the *first* place there are *cases in which perfectly healthy persons feign disease, induce disease, or claim that they have received an injury and profess to be suffering from symptoms due to that injury.*

These cases in which absolutely healthy persons claim to be suffering from the effects of injury or disease—pure malingering—are, in my experience, extremely rare. They are occasionally met with in club patients, in schoolboys, in hospital patients ("hospital birds"), in accused persons, and in persons who have been in a railway collision or other accident but who have not been really injured; indeed cases have occurred in which people who have not been in an accident at all have feigned symptoms, taken to bed, and claimed large damages from a railway company on account of an alleged injury. No case of that sort has come under my own notice, but I have seen several cases in which there has been gross exaggeration, or malingering pure and simple. I remember one case in which a train ran into the buffers at a station. A gentleman who was seated facing the engine was thrown forwards into the arms of a buxom lady who was sitting opposite him. His hat was knocked off and was indented—it was a new silk hat—that was the only damage which he seemed to have sustained. A few days after the accident he began to suffer from the ordinary symptoms of "railway spine"; these symptoms gradually got worse. He brought a claim against the railway company, which was eventually settled out of Court for £100.

In the *second* place there are *cases in which, after an accident or injury, the results or remains of previous disease are said to be due to the injury.*

These cases are more common than cases of pure malingering in persons who were previously perfectly · healthy; fortunately they are not very common, for in some instances they are extremely difficult and perplexing. We all know how frequently functional symptoms are combined with organic disease, and how

easy it is to mistake the results of old organic disease for those of recent disease, more particularly in cases in which one is unacquainted with the patient and the previous history, and especially in cases in which erroneous, misleading, or false statements are made regarding the previous history and previous condition. I have met with cases in which a congenital club-foot, a very old-standing facial paralysis, an ear discharge recurring for many years, an old scar on the cornea, epilepsy, tabes, and spastic paraplegia were said to be due to recent accidents. We had a case not very long ago in my insurance office in which a severe conjunctivitis was said to be due to dust getting into the eye during the patient's work, but in which it was proved that the patient was suffering from gonorrhœal conjunctivitis. I do not say that this patient was malingering. I mention the case as an illustration of the difficulty there frequently is in excluding previous disease, and in proving that symptoms, which are said to be due to a recent accident or injury, are in reality the result of previous disease.

In some cases included under this head the patient knows that the condition which he attributes to the accident was previously present—he is deliberately lying; but in others, as, for example, in cases of early tabes, of which I have seen more than one, he may not know this—he is not deliberately and wilfully trying to deceive.

In cases of this kind a minute and careful inquiry into the previous history as to the exact nature of the accident—whether the degree and kind of injury was sufficient to account for the symptoms and conditions which are present—will, in many cases, enable one to arrive at a correct conclusion; but there is often great scope for differences of opinion. In some cases of this kind the difficult question arises as to the relationship of trauma to the causation of the particular diseased condition which is present, such as spinal lesions, cerebral tumour, aneurysm, cancer, and innumerable other conditions which are not infrequently said to be due to an accident.

Then, further, in some cases the question occurs—Supposing the man is a diseased man when he gets the accident, is he entitled to receive compensation for the damage he has sustained? In my opinion, one is no more justified in injuring a diseased man than a sound man; but of course the amount of compensation which a diseased man should receive is, in many cases, very different from the amount of compensation which a sound man should receive.

In cases of this kind the whole circumstances of the case have to be carefully considered and taken into account.

During the first year that I was in practice I met with an interesting case of this kind. A girl, who was carrying in her arms a young child subject to epileptic fits, was larking with a young man. In attempting to strike her, it was said, in play, he hit the child. The child immediately took a fit and died in the fit. The young man was committed by the magistrate for manslaughter, and tried at the Newcastle Assizes. I was a witness in the case: I had made a post-mortem examination. Mr. Justice Brett, in summing up, laid it down that if the jury were satisfied that the child died from the fit, and that the fit was induced by the blow, they should bring in a verdict of manslaughter; but, he said, the degree of manslaughter was for him to judge, and not for the jury. The jury returned a verdict of manslaughter. The judge discharged the prisoner; he thought that, as he had already been some time in prison while waiting for the trial, he had had a sufficient sentence.

Cases every now and again occur in which persons who have been apparently perfectly healthy up to the time of an accident die apparently as the result of the accident, and in which it is found after death that they are, and have for many years been, the subject of grave organic disease. I think you, sir (the President), will remember a station-master who a few years ago received a slight head injury, and who immediately after the accident became ill and died some weeks later, apparently as the result of the injury. Up to the time of the injury this man had never complained of illness; he had for many years performed his arduous duties without being off work. He was, however, the subject of advanced cirrhosis of the kidney and marked arteriosclerosis. I have seen many cases of this kind: in some of them it was difficult to determine how far the accident was responsible for the result.

In the *third* place, *cases in which patients who are suffering from the effects of an accident or injury, or from ordinary illness not due to accident or injury, exaggerate their symptoms, or do not get well as they should be expected to do, but continue to suffer and go on claiming compensation.*

These cases are very common, in fact of everyday occurrence; they are the cases which will give rise to so much difficulty under the National Insurance Act.

In ordinary practice the aim of the patient, at all events of the great majority of patients, is to get well, and as soon as possible, and

he makes every effort to aid the doctor in getting him well. But if it pays a patient better to be ill than to be well, or if a patient is lazily inclined and is content to take a holiday on sick-pay—it may be half wages—there is no inducement to get well; in fact there may be an inducement to remain ill—to prolong the illness indefinitely.

In some of the cases included under this head the patient deliberately and wilfully prolongs the illness; that, of course, is malingering—partial malingering I call it. But in many cases the patient simply does not get well and does not return to work, because he has no powerful inducement to get well and to return to work; he goes on complaining for weeks, or it may be months, from symptoms. In many of these cases there is no deliberate intention on the patient's part to deceive. He is not malingering; he is a valetudinarian, not a malingerer.

We all know how very important the influence of hope is in enabling our patients to get well, and how a cheery doctor who expresses a confident opinion that his patients will get well, and who inspires them with hope, does get them well much quicker than another man who takes a gloomy view of things, who shakes his head, and who does not inspire them with hope and confidence.

Any mental anxiety, such as impending litigation, the prospects of the ordeal of a trial, of being examined and cross-examined in the witness-box, retards the patient's recovery. Everyone who has had much experience in railway cases knows that these patients never, or very rarely indeed, get well, until the case is settled, until the litigation is ended, and that they then often get well with remarkable rapidity. Now I do not for a moment suggest that all of these patients are wilfully exaggerating or malingering; many of them are perfectly genuine sufferers. They are merely bad cases of valetudinarianism.

One of the most striking cases of this sort which has come under my notice was that of a man, aged 30, whom I examined on behalf of a railway company some two years after an accident in which he had been slightly injured. He was suffering from the most marked symptoms of traumatic neurasthenia that I have ever seen; in addition there were some symptoms, which time does not permit me to describe in detail, suggestive of organic disease. I pointed out in my report that it was a case in which the patient would probably get heavy damages. He claimed £7000; he got £3500. I am informed that this man returned to

work a few weeks after the settlement, and that he has apparently been perfectly well and doing his work regularly ever since. Now I saw no reason to doubt that he was an honest man; I did not think he was malingering. I thought, and I still think notwithstanding the result, that it was a bad case of valetudinarianism, and not a case of malingering. At all events the case shows the important influence which settling the claim, especially if there is a very considerable amount in the way of damages, has in getting the patient well.

I have seen many cases of the same kind in which the symptoms were the result of ordinary accidents and injuries—miners and others who have been injured and who do not get well until the claim is settled, after which they usually, in my experience, rapidly get well.

The subject of valetudinarianism is one of very great difficulty and of very great importance. In many cases it is quite impossible to differentiate with accuracy and certainty, on purely medical grounds, partial malingering and valetudinarianism; and the other grounds on which one has to make a differential diagnosis are often insufficient to enable us to give a positive and dogmatic opinion. In many cases we suspect malingering, but it is only in rare cases that we are justified in positively stating that a patient is malingering. In many cases, too, it is difficult to say whether a patient is a valetudinarian or not.

In many cases, for example slight and static valvular lesions of the heart, bronchitis with emphysema, pain and stiffness in the back, the result of back injuries, sciatica, or neurasthenia, it is difficult or impossible to say *when* the patient is sufficiently well to return to work. The patient may say: I am not sufficiently well to work; I still feel shortness of breath on exertion: I still cough and spit: I still feel my leg stiff and painful; I still feel nervous and weak.

Formerly (before the introduction of the Workmen's Compensation Act and the National Insurance Act) many of these patients, especially men with wives and families depending on them, would make an effort to return to work at the earliest possible date. Nowadays there is not the same inducement to get well and to start work, and cases drag on for weeks or months. I repeat that many of these patients are not malingerers; they are merely valetudinarians. These are the cases in which there is likely to be so much difficulty in the future.

There are, of course, cases in which the Workmen's Compensa-

tion Act and the National Insurance Act are godsends. Over and over again I have seen patients—say with organic heart disease—decent, hard-working men with wives and families dependent on them, insist on being discharged from hospital before they were fit to return to work, with the laudable object of supporting their dependants. Those are the cases which one desires to see insured and well insured — well compensated and well looked after, medically and otherwise. I know of no sadder case than that of a man who insists on being discharged from hospital in order to support his wife and family, when one knows that the hard laborious work and strain to which he must subject himself will, in the course of a short time, be certain to result in another breakdown. These cases will still, I fear, be too frequently most inadequately provided for.

The cases of malingering which most frequently occur in a physician's practice are nervous cases; they are by far the most common and by far the most difficult cases. Purely surgical cases are, comparatively speaking, rare; the ophthalmic surgeon sees a large number of cases, the aurist a few cases, the dermatologist some cases. I have seen several cases in which skin lesions have been deliberately produced by young women, some, but not all, of whom were hysterical.

DIAGNOSIS.—The diagnosis of malingering is often extremely difficult; it has to be based partly on medical and partly on collateral evidence.

It is, of course, a more difficult thing to recognise that an article is adulterated than to recognise the genuine article. It is unnecessary to say that the success of the malingerer depends upon the exactitude with which he is able to represent the medical picture. I could feign many diseased conditions, such as an epileptic fit, an attack of angina pectoris or insanity, so perfectly as to defy detection. Fortunately for diagnosis malingerers are very rarely skilled and experienced in the conditions which they attempt to represent; they usually overdo their part.

It is very difficult to feign organic disease; it is the functional conditions which are easily simulated. Consequently, the first thing in making a diagnosis in a case of suspected malingering is to make a careful medical examination, and to exclude organic disease.

In nervous cases the differential diagnosis of organic and functional disease, unless one is specially skilled and experienced in nervous disease, is often very difficult. One sees this in private

practice in cases in which there is no question of compensation and no suspicion of malingering. One sees cases in which experienced hospital physicians differ with regard to these cases, in which one man says there is organic disease and another there is no organic disease. Many cases of this kind have come under my notice. Now if hospital physicians differ in this way it is impossible to expect the ordinary general practitioner to come to a correct conclusion as to the nature of many of these most difficult cases.

Then there are some diseased conditions, some of them very serious, which the most expert and experienced physician is unable to detect, such, for example, as small, deep-seated thoracic aneurysms (which even the X-rays may not disclose) and disease of the coronary arteries with severe angina pectoris. I have seen cases of this sort in which it was impossible to detect any definite evidence of organic disease, in which the patients have died from the condition soon after my examination.

In those cases of suspected malingering in which there are symptoms or signs of organic disease—I am speaking more especially of cases said to be due to accident or injury—one has to make sure that the organic lesion was actually due to the accident or injury, and that it was not present before the receipt of the injury. A careful inquiry into the previous history will usually enable us to determine this point.

In cases of partial malingering the difficulties of diagnosis are still greater; it is often impossible to say how far the symptoms are genuine and due to the results of injury or to the organic disease which is present, and how far to malingering and wilful exaggeration on the part of the patient.

Certain things show that there is organic disease, such, for example, as localised muscular atrophy, the reaction of degeneration, paralysis of the sphincters, acute bed sores, the Babinski sign and ankle clonus (if perfectly typical and persistent and not merely temporary and evanescent), loss of the knee-jerks, optic neuritis and optic atrophy, definite changes in the cerebro-spinal fluid, " skew-deviation " of the eyes. It must, however, be admitted that apparent exceptions to most of those statements are sometimes met with. Paralysis of the sphincters, for example, which is usually a very definite sign of organic disease, was said to have been present for six weeks in the case of the man who got £3500 damages, to whose case I have already referred—that was one of the things in the case that we thought positively indicative of organic disease.

Let me here say a word or two with regard to the value of

electrical tests in cases of paralysis. Some people seem to think that one can differentiate paralysis and malingering by means of electrical tests. That, of course, is quite erroneous. It is hardly necessary to say that in many cases of permanent paralysis the paralysed muscles respond actively to the faradic current. At the last meeting of the British Medical Association there was a discussion on the "Medical Training for the Detection of Malingering" (*Brit. Med. Journ.*, 3rd August 1912, p. 222), and the gentleman who introduced the discussion is reported to have said: "Other numerous examples of the many varieties of malingering could be given; for instance, cases in which joints, though freely flexible to passive, are apparently rigidly fixed to voluntary, movement, and cases in which muscles though apparently paralysed readily respond to the faradic current are so common as not to be worthy of discussion in detail." In other words, that statement implies that if an apparently paralysed muscle contracts to the faradic current it is not paralysed. There must be some error in the report, for I cannot conceive that the gentleman who introduced that discussion could possibly have made such a statement. In a recently published book on malingering equally erroneous statements as to the effect of electricity in cases of paralysis and of the value of electrical tests in the diagnosis of malingering are made.

Then, again, it is sometimes concluded because a stiff joint or a contractured limb relaxes under chloroform and the joint is normal that the case is one of malingering. I have seen many cases, and published some of them, in which rigid contractures, due to functional nervous causes, have lasted for weeks and months and years, and in which the contractures have been relaxed under anaesthetics and the condition rapidly and completely cured by appropriate treatment (a confident opinion that there was no organic disease, and that the patient would rapidly get well, together with isolation, the electric current, and hypodermic injections of water).

Modern methods of research, such as electricity, the X-rays, the perimeter, are often, however, of very great use in the differential diagnosis of obscure cases, in differentiating functional and organic disease, and as an aid to the detection of malingering.

The following is a case in point :—A girl, aged 13, complained of blindness. She appeared to be in robust health. Ophthalmoscopic examination showed that the fundus was perfectly normal; there was no headache and no vomiting; with the exception

of the impairment of vision there were no symptoms. Careful examination with the perimeter showed the presence of a central scotoma. Dr. George Mackay, who kindly examined the patient, diagnosed a retrobulbar neuritis, an exceedingly rare thing in an apparently healthy young girl, aged 13.

Corroborative non-medical evidence is the second class of evidence which one has to trust to. If a nervous case presents unusual symptoms which one cannot explain by a syphilitic or other apparent cause, one suspects malingering, more especially if the patient has anything to gain by deception.

In cases of this kind one has to lay traps to detect the deceit. I have the records of some railway cases in which the patients have been watched by detectives, the malingering proved, and the supposed patients convicted either of perjury or of trying to obtain money by false pretences.

One of the ordinary tests which one employs in cases of nervous disease is Romberg's test. It is not of great value, because inability to balance the body steadily in the erect position may be due to psychical causes or to weakness as well as to inco-ordination, and because it is so easily simulated. In employing Romberg's test in cases in which one has reason to suspect deceit I take care to see that the patient does not know what I am testing. I tell the patient, for example, that I am going to see whether he can hold out his hand steadily, and then when his eyes are shut and his feet close together bring the tip of his forefinger accurately in contact with the tip of his nose—the finger-nose test. I show him what I wish him to do. I see at once whether he has Rombergism or not. He thinks I am testing his ability to touch his nose, whereas I am testing his ability to stand steadily in the erect position with his feet close together and his eyes shut. That is an example of the sort of trap one sets: an experienced observer gets into the habit of using many dodges and traps in cases of this kind. Everything that the patient does and how he does it, both during the examination and when he does not think that he is being observed and examined, should of course be noted.

At the Glasgow Meeting of the British Medical Association, the late Professor Grainger Stewart showed a most remarkable case —an old woman who took an epileptic fit whenever she went into the dark. Professor Grainger Stewart took her to Glasgow in a first-class carriage, and he told the meeting that she had a fit in each of the tunnels. The case attracted much attention. Shortly

after the meeting I one day followed this patient into the surgical entrance of the hospital. She went down the stairs immediately inside the entrance, into a very dark corner, struck a match, and lighted her pipe. She was very indignant when I asked her why she had not taken a fit. I have not the slightest doubt that she was an arrant malingerer.

Now from what I have said it will be apparent that there are many cases in which one suspects malingering, but there are few cases in which one can definitely certify that a patient is a malingerer. As pointed out in an article in the *Times* of 7th November last, the panel doctor who certifies that a patient is malingering assumes a grave responsibility, and if he makes a mistaken diagnosis runs a great risk of a complaint being made against him, of getting into grievous trouble, and of having his name struck off the panel. In giving certificates one should be very careful in the wording of the certificates. Except in very clear cases one should avoid definitely stating that the patient is a malingerer; in doubtful cases one should say that, " so far as my examination, knowledge, and experience enable me to judge, the patient is fit to return to work," or, " so far as I am able to detect there is no organic disease, and the patient is able to return to work." The doctor who is asked to certify whether a patient is malingering ought to be perfectly independent of the result.

Repeated examinations are often necessary in order to determine whether a patient is suffering from functional or organic disease, and whether he is malingering or not. The German plan of obliging these doubtful cases to go into hospital in order that they may be under skilled observation and repeated examination is a good one.

In order to prevent malingering under the National Insurance Act I would suggest—

1. *An exhaustive medical examination by the panel doctor.* The only sure means of detecting malingering is careful medical examination and careful medical observation by a competent doctor. In cases of prolonged sickness and in cases of repeated sickness the patient's fellow-workmen no doubt often become suspicious, but the malingering may have gone on for weeks or months before that suspicion is aroused. In most cases malingering can only be detected in its earlier stages by the medical attendant.

2. *In doubtful cases consultation with a specialist.* The panel doctor must be protected, and the only way to protect him is by

giving him the opportunity of calling in an expert to decide upon the nature of the case and to give a certificate. The consultant must be a specialist in the particular department of medicine or surgery which is concerned in the particular case. A physician, for example, who has no special knowledge of nervous disease cannot give a reliable opinion on a difficult nervous case; a surgeon cannot be expected to give a reliable opinion on a difficult eye case or ear case. The expert should be perfectly independent of the result, and these experts should, of course, be properly paid.

3. *Observation and repeated examination in hospital in doubtful cases.*

4. *A time-limit to the purely functional cases, and in cases in which there is no obvious organic disease.*—In cases of neurasthenia, for example, the patient ought not to be allowed to go on drawing pay indefinitely. A certain time-limit should be laid down. The patient should be told that there is no organic disease, that, medically speaking, he is quite fit to work, that unless he goes back to work on a certain day the money payment will cease. This plan would no doubt entail a real hardship in some genuine cases of functional disease, such as neurasthenia—and there are many such—but I am afraid this hardship must be faced.

It would be exceedingly difficult to lay down a time-limit in cases in which there is organic disease—in a case of organic heart disease, for example, in which, as I have already pointed out, it is often exceedingly difficult to decide whether the patient is fit for work or not. But in cases in which there is no obvious organic disease I would certainly suggest that there ought to be a time-limit.

Addendum.—In some countries the patient who claims sick benefit has to make a direct money contribution towards such sick benefit; if such direct contribution is sufficient in amount it will, of course, stop much malingering and much valetudinarianism. Unfortunately under the National Insurance Act no money contribution is required except the weekly payments which all insured persons have to make.

DISCUSSION.

The President (Mr. J. M. Cotterill) thanked Dr. Bramwell for his interesting, practical, and comprehensive sketch of this very large subject. As time was limited he would not detain them further than to say that recent benevolent legislation had increased enormously the work of physicians and surgeons — particularly hospital work—while it had done anything but increase the self-respect and honesty of the individual. He would like also to know what this disease under discussion was to be called. Was it malingering (hard g) or

malingering soft g ? It was curious to hear some medical men use one pronunciation and some the other; the reader of the paper, for example, with commendable impartiality had used both.

Dr. George Mackay said that simulation in connection with eye complaints may take various forms. The production of inflammation of the surface of the eye by irritant applications is occasionally, but not frequently, indulged in by malingerers, since the natural tenderness and sensitiveness of the organ protects it against gross abuse. Uncontrollable blinking of the eyelids is not unfrequently assumed by young children who think it a pretty habit, or wish to excite sympathy, and it has not been unknown among soldiers and sailors anxious to escape from uncongenial duty. Both of these usually overplay the part and are easily discovered. The most common cases of malingering met with now are in connection with the Workmen's Compensation Act or with claims under policies of insurance. There may be an assumption of total blindness of both eyes, but much more frequently the claim is for serious loss of vision or total blindness in one eye which has been directly injured, and often an assertion that the vision of the other eye is not so strong as it was before the injury. The difficulties in the recognition of malingering which beset medical men generally are not quite so great in the case of the ophthalmic surgeon, since the eye is an organ which can be examined with very considerable completeness both within and without, and serious functional disturbance is usually accompanied with definite objective signs either in the media or in the fundus. In other instances a lesion can be discovered by examining the field of vision. The reaction of the pupil to light is very helpful. If a man says he cannot see and yet his pupil reacts, that gives him away, for the only thing which could produce such a state of matters would be a very uncommon brain lesion, almost certainly not due to an injury directly received to the eye, so that in many of these cases one proceeds with the examination in the sure confidence that the patient is a liar. Under these circumstances it adds a new zest to life to have to deal with a malingerer. One feels as if one were engaged in a little light rapier exercise, and there is an element of sport and pleasurable enjoyment to be got out of the investigation of such cases. There are many helpful methods of testing whether a patient is employing both eyes or not; thus, if a prism placed well centred in front of one eye brings forth the statement from the patient that he sees two objects it is obvious that he is using both eyes. By another method the colour sense is taken advantage of. A pair of spectacles, mounted with one glass red, the other of complementary bluish-green tint, is placed before the patient's eyes, and he is requested to look preferably at transparent test-type similarly coloured, composing a word some of the letters of which are perceptible only to the one eye and some to the other. If with both eyes open he promptly deciphers the whole word, it is obvious that each eye must have been contributing to the result. The maintenance of perfect consensual movement of the eyes and the admitted recognition of the whole of a word when only part is visible to each eye is a further aid to detection. But one of the simplest means of examination is, after having made a most sympathetic study of the patient's condition and satisfied oneself that there is apparently nothing which should prevent him seeing, to proceed as follows :— To place in front of the sound eye a transparent but strong convex lens say +10 or +12D instead of an obscure disc, leaving nothing in front of the damaged eye, or placing in front of it whatever glass the examination of the refraction objectively as by the shadow test has led one to anticipate should be helpful. If the patient now succeeds in

reading Snellen's type or recognising the form of objects no larger at 6 metres' distance it is at once evident that he must be employing the eye which he regards as defective, since through the strong convex lens the admittedly better eye is quite incapable of observation.   There are cases, however, which are on the borderland between malingering and hysterical suggestion, and in these a psychical element undoubtedly comes in.   Dr. Mackay published such a case some years ago (*Edinburgh Hospital Reports*, vol. v.), that of a young man who, using a telephone in a miller's office during a thunderstorm, was struck by lightning, at least the telephone wire was struck: the instrument was dashed from his hand and his face slightly burnt.   The late Dr. P. A. Young brought him to the Infirmary within an hour of the accident.   He did not complain of any defective vision.   He went away and received a great deal of sympathy from his employer, his family, and his friends, and gradually developed in the course of a few weeks a profound conviction that he could not see.   On examination it was found that the reaction of the pupil to light and the appearance of the eye were normal, and Dr. Mackay was convinced that the patient was in a condition of "suggested hysteria."   It was suggested to the patient that of course he had had a shock, but that it merely wanted a little exercise to bring the vision out again.   The good eye was covered, and by means of gentle persuasion and encouragement in observation, combined with intervals of rest for a few seconds, the patient's vision was happily "drawn out" until he was able to read from the largest to the smallest of Snellen's and Jaeger's types, whereas at first he was professing inability to see hand movements.   A few days ago another case occurred, sent by Dr. Mackay of Berwick.   The patient had had an operation for a dermoid on the cheek, and it was said the eye had been damaged, and Dr. George Mackay began to be afraid that his clansman was to be accused of damaging the eye while removing a small sebaceous cyst from the cheek.   Examination proved that the patient had a perfectly normal eye, and by means of the strong convex lens trap above described conviction was brought home to him that the vision was unimpaired.   Dr. Mackay was entirely in agreement with what Dr. Bramwell had said about the risks of malingering under the Insurance Act, and he was sure they would all rejoice if his paper could find its way into the hands of Mr. Lloyd George and his supporters, so that they might realise more fully the points on which stress had been laid.

Sir Thomas Clouston thought the subject most interesting from a psychological point of view.   The phenomena of deception which had been so carefully described were seen everywhere in living beings.   They began amongst insects—and who had not seen plover and other birds "playing lame" in order to protect their eggs and young.   There was no doubt that the constitution of the patient had to be taken into account in every case, and it is necessary to inquire whether a man or woman who complains of illness to secure a money compensation has a strongly neurotic temperament and disposition or not. There is no doubt that many nervous people are malingerers of the valetudinarian and quite honest type.   Malingering by suggestion had been referred to by Dr. Mackay, and that is common among such persons.   His (Sir Thomas Clouston's) chief experience consisted in detecting whether a prisoner was insane or not when he wished to escape punishment.   He once saw a man in jail who was threatening to commit suicide.   The governor told him that they were tired of watching this man, and that he must either certify that the man was insane or that he was sane; if he was not insane they would leave him unwatched in his cell, and the responsibility would rest with him (Sir Thomas

Clouston) if he committed suicide. Not wishing to take that responsibility, and desiring to have time to observe the case, he certified the man as insane, although he thought he was not, just as a doctor sends a suspected erysipelas case to an observation ward. He had once an unusual experience. A clergyman got into some sexual difficulty, and the result, if proved, would have been that he would have lost his livelihood. He was sent to an asylum, certified by two capable medical men, one of them of very high standing indeed. Sir Thomas Clouston was sent for to see the patient, and the attendant informed him that he had noticed the man reading a green-bound book very attentively and frequently. The book was found to be Sir Thomas Clouston's clinical lectures, and in the chapter on delusional melancholia every one of the symptoms from which this clergyman appeared to be suffering was underlined. It was hardly necessary to say that he had to make his exit on the ground that he was not insane. There was another kind of malingering in which the patients, especially melancholic patients, exaggerated the mental symptoms to excite sympathy. The whole class of valetudinarians and hypochondriacs needed careful examination when they claimed compensation for injuries or illnesses. His practical point was that in the case of nervous people, helped by pure suggestion and imagination, symptoms were simulated which were honestly believed by the patient to be due to disease. Through the trophic influence that the higher cortex exercises over every part of the body many symptoms, such as anaesthesia or paralysis, might be set up, and might eventually end in organic disease simply through such suggestion. There is no reason indeed why many diseases of a definite kind should not arise or be prolonged through psychic or cortical influences, just as they are often cured by such means. A highly nervous man or woman should often have the benefit of the doubt where an apparently dishonest simulation of disease is suspected.

Sir George Beatson said that in his experience there were often other causes at work. It seemed to him that their legal brethren had a good deal to do with the causation. It was the old story of the man who met a friend after an injury. The friend asked him if he was much hurt, and he replied, "I don't know ; I haven't seen my lawyer yet." That is one of the elements in these cases which has to be taken into consideration. If there were more rigid rules laid down as regards the way in which these cases are presented to the Courts, there would be much fewer of them. That is a factor in malingering that could not be altogether overlooked.

Dr. Bowie said, while listening to Dr. Bramwell's very interesting paper one or two thoughts struck him. In many cases in the hands of lawyers the lawyer prevented the patients going back to work until the case had been settled ; that was why in many cases patients got well immediately the cases had been settled. He was sorry that the question of prevention had not been gone into more fully. Dr. Bramwell had been treating of the condition after it was established. It seemed that a little more might be done in preventing malingering and valetudinarianism. In the article in the *Times* referred to by Dr. Bramwell it was stated that malingering was going to cost the Insurance Commissioners about £1,000,000 per annum in sick benefit. That being so, one begins to wonder which party to this Insurance Act is going to benefit by the prevention of malingering—the Government, the employer, the beneficiary, or the medical man? No doubt malingering and valetudinarianism will be a curse to the country unless prevented, therefore the State is going to suffer. The employer is going to suffer because he has to supply part of the sick benefit. The bene-

ficiaries are going to suffer in proportion to their contributions. The medical
men are not going to suffer to anything like the same extent as the beneficiaries.
Malingering and valetudinarianism are not going to cost the doctor's pocket or
work very much ; they are going to cost the beneficiaries a great deal more. It
seemed to him therefore that the prevention of malingering and valetudinarianism
ought to be, partly at least, the duty of the beneficiary himself. Instead of
coming in at the end, when the condition was well established, some effort ought
to be made to prevent the evils. Such an effort might be making the patient pay
part of his medical attendance out of his own pocket. Why was the Insurance
Act going to cause so much malingering and valetudinarianism? Insurance
against sickness of itself should not be the cause. It was because the beneficiary
was to get unlimited medical attendance for a fixed sum. The "contract" was
in his Dr. Bowie's opinion the cause. If the patient had to pay a part, however
small, of the medical fees out of his own pocket he would think twice before
visiting the doctor unnecessarily. It seemed to him that the imposition of this
small sum would mitigate the evils to a considerable extent. Not only would
it tend to prevent these evils and do away, to some extent at least, with the
expensive and somewhat cumbersome methods suggested by Dr. Bramwell, but
it would have this further advantage that it would put the means of cure in the
hands of those most interested. The system of making the patient pay a small
fraction of the medical fee out of his own pocket was coming more and more into
force in those countries where they already had State insurance.

Mr. Cathcart said a few words from the surgical standpoint. He had seen
many cases with claims sent in for injuries to joints, muscles, bones, and
backs, and found it important to begin by allowing the patient to tell his own
story. This, he thought, was not always done. Personally he made the patient
explain his symptoms and everything that had happened, and never allowed
him to give the diagnosis of anybody else. After the man has talked in
his own way for a little time one begins to get some mental impression of
the individual. Then, as Dr. Bramwell had said, he found it of great im-
portance to look for objective conditions. Among other simple things often
overlooked is the condition of the muscular development of the limb affected.
Sometimes he found that men were accused of malingering when he did
not think they were, because their statements were supported by the presence of
atrophy of muscle, which would not have taken place if the man had been a pure
shirker. On the other hand some men who seemed unable to shut or to open
one hand, or whose grasp was weak on one side, had an equal muscular development
of both arms. In such cases he was generally able to show that their apparent
want of power was merely want of will. In the case of a man who says he can-
not close his hand when there is nothing objective to explain it one may often
quietly close his fingers while his attention is distracted by being induced to
think of something else. Then often by watching a man take off his clothes
during the interview and getting him to talk about something else he will
make a movement which otherwise he will deny his ability to do. The other
day, for instance, a patient said he could not raise his arm up to a right angle.
On asking him to take off his shirt the shirt stuck : he seemed unable to get it
beyond a certain point. On being assisted, however, and when bending down, the
supposed stiff arm was manipulated right above his head, and the shirt came
off easily. When asked later on to raise his arm he said he could not do it, and
held it fast. By that time, however, the free mobility of his arm had been
demonstrated.

Dr. Edwin Bramwell was of opinion that there existed a wide-spread tendency to regard patients suffering from functional disease of the nervous system, and notably from hysteria, as malingerers. The subject of hysteria was not a malingerer if by malingering was implied the wilful or voluntary simulation of disease. Hysteria was a disease many of the symptoms and physical signs of which were characteristic and occurred in combinations incapable of successful imitation unless by an individual possessed of expert knowledge. The simulation of neurasthenia, on the other hand, offered far greater possibilities to the malingerer, for unless in pronounced cases the symptomatology was apt to be entirely subjective. All would probably agree that it was seldom possible to successfully simulate organic disease. The cases which essentially gave rise to the really difficult diagnostic problems were those in which the malingerer was actually suffering from organic or functional disease. Repeated examination and continuous observation might be necessary before it was possible to arrive at a satisfactory conclusion in such a case.

Dr. Brock said the question Dr. Edwin Bramwell had raised as to whether the hysterical and neurasthenic subjects actually are as deserving as the organic sufferer was an important one. It seemed to him that the problem under discussion is the problem of moral responsibility. He took it that in malingering the patient is "to blame" and can help himself, but it also seemed to him that the patient is to blame and can help himself in neurasthenia, although in the latter case there is not such a large element of culpability. He would like to hear what Dr. Byrom Bramwell had to say to that, because it appeared to him that there was no essential difference between the two, but merely one of degree. What one wanted to get at was, "How far is the man putting it on" for the sake of gaining extraneous help, whether moral or financial?

Dr. Edwin Bramwell replied that the subject of hysteria or neurasthenia is an unconscious or subconscious simulator, whereas the malingerer is a wilful simulator.

Dr. M'Kendrick said Dr. Byrom Bramwell stated that one must simulate wilfully to be a malingerer, and that it was impossible to simulate unconsciously.

Dr. Byrom Bramwell replied that what he stated was that the person who unconsciously simulates was not a malingerer.

Dr. M'Kendrick, continuing, thought it would be well to come to some definite understanding as to what the term really means. Like the terms "accident" and "injury," malingering had not been defined in the Workmen's Compensation Act. He thought it competent to define a conscious malingerer. Personally he would be inclined to define the malingerer as the man who is receiving compensation when he is not entitled to it. Dr. Byrom Bramwell quoted the case of a workman who alleged he was unfit for work, and he was obviously unfit for work, and it was proved that that man was suffering from a disease and not injury—gonorrhœal conjunctivitis—which he had not received through his employment. Now that man was unconscious of the cause of his disease, and was he not to be called a malingerer? Several gentlemen had spoken on the subject of the prevention of malingering, and Sir George Beatson referred to the sharp lawyer, who certainly has a great deal to do with the prolonging of convalescence. Medical men are perhaps not aware that there are quite a number of lawyers who pay money to the workmen out of their own pockets for weeks or months at a stretch on the chance of getting it back a hundredfold. They must prevent the workmen going to these lawyers. It is

purely and simply, as Sir Thomas Clouston said, human nature. It is a moral obliquity on the part of the workman, and a little more will send him over the precipice into malingering. The shark lawyer is usually the " little more."

Dr. J. V. Paterson said that he had had a very large experience of the Workmen's Compensation Act, and in the last two years had reported on 71 cases under it. The Act of 1907 was, of course, an absolute necessity in an industrial country such as ours. In cases of eye injury the surgeon could determine very definitely what injury had been sustained and the amount of disability from which the workman suffered. Dr. Paterson's uniform experience in Court as regards expert witnesses (he was not referring to general practitioners) was that little or no difference existed in the evidence as to facts observed on examination, though occasionally, owing to the mental attitude of the man giving evidence, there might be a difference of opinion as to what work the injured workman was fit for. Before a report was sent to any lawyer or insurance company it was necessary to make a very thorough examination of the workman, otherwise some of the manifestations of disease or injury might be missed, and the man judged to have nothing wrong, when, on more careful examination, organic change might be found. No attempt whatever should be made to co-operate with lawyers or counsel with the object of making the best of a weak case. If one could not satisfy oneself that one would have sent practically the same report if acting for the other side, then the report was biassed, and ought not to be sent in that form. In Dr. Paterson's opinion it was impossible for a Sheriff unaided to judge the value of medical evidence which might be highly technical. The presence of an assessor was therefore of enormous value. The assessor ought to make an examination of the workman in order that he may be able to form a just estimate of the evidence before the Court. Some might think that this was giving the assessor too much to do with the decision, but in Dr Paterson's opinion this method, in eye cases at least, did much to further the giving of just and impartial decisions. One of the most objectionable features of the Act was that it provided a happy hunting-ground for the speculative lawyer who brought cases into Court which could, with much greater advantage to both employer and employee, have been decided outside. In giving a report Dr. Paterson took very good care never to use the word malingering, and generally got out of it by saying that " so-and-so has very much better vision in the eye than he himself imagines." One did not like to say in the witness-box that a man was actually malingering, though it could be proved up to the hilt in certain eye cases. In Dr. Paterson's experience there was hardly ever any doubt that an injury of some sort had been actually sustained. Usually when the loss of vision could not be explained by the alleged injury it was found that the man, his family, and everybody connected with him, implicitly and honestly believed that the condition followed the injury. Miners were, of course, very liable to slight injuries of the eye, and on looking with a magnifying lens at the eye of an old hewer one always found large numbers of carbon particles embedded in the conjunctiva and cornea. Out of the 71 cases seen he had only come across 3 out-and-out malingerers. One case was that of a low-class miner who had received an injury followed by ulceration in one eye, but who, after the ulcer healed, remained off work for a very long period— about 1½ years—and finally maintained that he had also lost the sight in the uninjured eye. This eye was obviously healthy on examination, and the man's assertions as to his blindness during examination showed very crude inconsistencies. After careful examination he was shown to the door, although pro-

testing that he could not possibly find his way to the station without his friend, who had brought him to the house but had in the meantime gone away. He crossed the street, constantly looking back at the house, went into the public-house round the corner, had a drink, lit his pipe, crossed a busy street, and eventually walked along Princes Street among the crowd. A man guilty of such shameless and gross malingering ought, of course, to have been imprisoned. The second case was that of a youth of 18 brought by his father, who indeed conducted the case. The youth had practically lost the vision of one eye from a very bad ulcer, but the remaining eye was an absolutely good one. The father asserted that the other eye was also blind, and the youth passively assented. The uninjured eye having been found to be absolutely normal the pair were dismissed after having been told that these assertions about blindness would not be listened to. The boy returned to work in the pit in a fortnight, but later his case came before the Court on the ground that work caused head-ache. On the day of the trial Dr. Mackay examined him in the Sheriff's room, and told him that he must be careful about the truth of his statements, otherwise he would find himself in an awkward position. The boy straightway read the last line of Snellen's test type. The third case of malingering occurred in a low-class labourer, and was of a crude and easily detected kind corresponding to the level of his intelligence.

The common type of case that came before the Courts was the exaggerator, and of these large numbers existed. A certain amount of exaggeration of symptoms was excusable in a man who had had a severe injury and who was naturally nervous and inclined to be hypochondriacal. The companies often made a great mistake in the high-handed and arbitrary way in which they were inclined to treat these men. Out of the 71 cases seen 24 were cases of undoubted exaggeration. Some of the men exaggerated the defect in the injured eye, a great many alleged that the sound eye was becoming affected, while a goodly number merely exaggerated symptoms, complaining of vague pains in the head, giddiness, and such like. In many of the cases it was very difficult to determine exactly the amount of visual defect caused by the injury, especially when both eyes were more or less defective, as, for instance, where a man had suffered from a corneal ulcer first on one eye and then on the other, or where the uninjured eye was optically or otherwise defective. Various traps and pitfalls were employed to test the truth of the man's statements as to his vision. It was very important in making an examination to be sympathetic and gain as far as possible the man's confidence. Experience showed that in these cases where there was evidently a considerable amount of diminution of vision and loss of visual efficiency the Court was inclined to deal generously with the workman.

With regard to the cases of unnecessary litigation Dr. Paterson was of opinion that a standard of compensation should be set up for certain common injuries in certain trades, *e.g.*, the loss of an eye in a miner. Cases as like each other as two peas continually cropped up and were continually being decided in Court. The presence of a highly qualified assessor would, in his opinion, do a great deal to suppress the speculative lawyer, who would soon realise that he had a very poor chance of getting a favourable decision unless in genuine cases. With regard to the nervous and neurasthenic type of injured workman Dr. Paterson said that he sometimes felt himself in a real difficulty. On several occasions workmen had come to him obviously suffering most acutely from extreme nervous anxiety, and indeed in some of them it was difficult to conduct a satisfactory examination. In one or two of the cases Dr. Paterson had felt his morality and his sense of

duty crumbling very much as in the case of a previous speaker in a somewhat similar difficulty, and he had felt very strongly inclined to certify a man as unfit for work simply because he did not want to take the responsibility of pronouncing him fit. In such a case the oculist could usually get out of the difficulty by saying that as far as the eye condition went the man was quite able for work. The neurologist might then decide whether the man suffered from traumatic neurasthenia or serious organic disease.

Dr. Sym thought a tariff for the loss of an eye or of some other part, or a relative loss of vision, would never work properly. The loss of one eye might mean an enormous question to one man and comparatively little to another. A watchmaker who always uses his right eye and who loses his left eye in an accident would lose almost nothing; but the person who requires binocular vision loses all his working capacity in such a case.

Dr. Paterson said it is done in Germany; the trades are classified. The cases he referred to were miners or working men, and similar cases had been tested by the dozen year after year. It was absolutely unnecessary to have this constant litigation.

Dr. Sym said he did not want to dispute the point with Dr. Paterson; in his view a method of compensation based simply upon the organ lost or injured could hardly be a just method. Another thing which recent legislation had done was to increase the difficulty of a man getting work once he has been injured, therefore that man naturally thinks he had better get the most out of the present accident. A good deal had been said about the evils of the Insurance Act, and he was not going to defend it, but he thought there was one way in which some good might be got out of it, namely, there would be a record of the condition of "John Smith" at such and such a date. To take a categorical case, a man may come with an ulcer on the cornea who has had a previous ulcer with a good deal of permanent damage. He states that he has met with an accident of an uncertain nature. He recovers and goes home. Then he fancies that he would like compensation, and claims it on the ground that he had previously had a perfectly good eye prior to this "accident" that had in reality never taken place. In such a case there would be a record of an opacity of the cornea; this record could be called for by the Court and the matter cleared up. Those frauds were continually being attempted. The existence of such official records is one of the plums in a very noxious pudding. He failed to see why in the case of these gross examples of malingering the law should not be brought into operation and one or two of the offenders punished; it was just as much a crime to pretend to be deaf or blind or have no legs in order to get compensation from an employer as it was to pick his pockets.

Dr. Chalmers Watson was doubtful whether the suggestion of a "time-limit" for recovery was a practical one, likely to be useful in practice. Neurasthenia is a definite disease, a neurasthenic element is an important factor in many cases of valetudinarianism, and psycho-therapy is a valuable factor in the successful treatment of these cases, but the speaker believed that the psychical effect on the patient of the time-limit threat suggested by Dr. Bramwell would act in many cases in the direction opposite to that desired. A great desideratum in the management of these cases, alike in the interests of the patient and the insurance company, was some scheme of co-operation whereby, after an injury, the injured person was put under the most favourable conditions for recovery. It was no uncommon experience to find men who showed evidence of definite organic disease, probably in great part the result of an accident, who had been

receiving compensation for six months or longer, and yet on inquiry one finds that the first essential in the treatment of these cases—complete rest in bed for a time—had been overlooked. This entailed in many instances a serious loss to the insurance company, and, what was worse, led to the development of some permanent organic disease which might have been prevented.

Mr. George Chiene said, one point which had not been considered was the interests of the other patients that the general practitioner has to examine. When in South Africa one of their duties was to take in turn the examination of a large number of militiamen who were associated with the camp. The malingerers were at first treated with the greatest kindness and generosity until suspicion was aroused, and finally it came to be that some of the men who were really ill suffered in consequence of the malingering of their fellow-patients. That is a point that men dealing with patients under the Insurance Act will find a matter of considerable importance in the future.

Dr. Pearson said some hard things had been said about lawyers, but he would like to be sure that doctors were quite free from blame. Speaking as the medical referee for Linlithgow, the difference of statement made as regards facts seemed to him to be a disgrace to the profession. He saw no reason why two medical men representing the insurance company and the workman respectively should not arrive at the same conclusion as regards facts, though they might differ as to a man's ability to work. It seemed to him that in many cases where the medical men arrived at different conclusions, stated different facts, and obscured the actual conditions by minimising important features and by exaggerating unimportant details, they must do so either deliberately or from insufficient examination. The lawyers might well ask why do these things occur? On one occasion, when acting as assessor in the case of a man who had had an injury to the spine and the pelvis, the doctors for the insurance company asserted that the man was fit to work, his own doctor said he was not. In cross-examination nothing came out to show why these men had not arrived at the same conclusion. Dr. Pearson saw the man in the usual way, and on examining him and making him bend forward there was not the slightest difficulty in making out that the sacrum became partly dislocated away from the ilium. One could imagine no condition which would render a miner more unfit for work than that. Why that case came into Court was a puzzle. He thought the medical profession was increasing malingering simply by "taking sides."

Dr. Elliot Dickson Lochgelly said that for many years he had practised in a colliery district in Fife and came in contact with many of these compensation cases. He had got very little further light from the discussion as to how the ordinary general practitioner was to treat these cases except by a thorough examination made at the beginning. He was afraid the general practi- tioner took the view which Mr. George Chiene did when in South Africa, and suspected in every case that the man was a malingerer. When he began his professional life he had a high ideal of human nature, but he was sorry to say he had had to change that ideal. It was a very serious matter indeed from the point of view of morality. The *morale* of the Fife miner before the passing of the Workmen's Compensation Act was of the highest; he had become morally quite changed, after meeting with an accident, owing to the operation of the Work- men's Compensation Act; *e.g.*, before the Act the average time for a fracture below the knee to recover was three months, when there was no compensation; since then it has been over six months. What the amount of malingering is to

be under the Insurance Act Heaven only knows! He put the average duration of illness down at fourfold the length of all ordinary cases at present. Under the Workmen's Compensation Act a man has to prove that he is unfit for work, under the Insurance Act he has simply to say that he is ill. It was very difficult for the general practitioner to get any more light on suspected malingering except by thorough clinical examination. Sir Thomas Clouston had referred to nervous people. They are all nervous when they get hurt, and when the Insurance Act comes into force they will be more nervous still. Traumatic neurasthenia is a common topic of conversation in the mining villages of Fife. Dr. Sym had mentioned the increasing difficulty an injured man has of getting work in the open market—a very interesting point. Incapacity for work was clearly decided in an eye case in the House of Lords not very long ago to include incapacity for *getting* work. Mr. Lloyd George talked of the moral effect of the man's fellow-workmen in preventing malingering. Dr. Dickson thought it would have absolutely no effect; it was building a house on the sand.

Mr. D. M. Cameron, speaking as a representative of the insurance world, ventured to think that Mr. Lloyd George had not been very far wrong in relying upon the detective work of a man's fellow-workers. Friendly societies had been working in this country for generations, and malingering had not been prevalent to any great extent. In friendly societies they had a way of delegating certain members to distribute the pay and act as detectives, and he thought that had had some effect. They must look in the future to make malingering criminal and punish it. On the part of the insurance men present he thanked the Society for their invitation to be present and for the very enjoyable evening they had spent.

Dr. Byrom Bramwell, in replying, thanked the members for the way in which they had received his paper. The discussion had, he thought, on the whole, been interesting and useful.

The definition he had given very fully described what, he thought, ought to be included under the term "malingering"; the term unconscious malingering was, he maintained, an absurdity. Valetudinarianism was not malingering. Everybody had agreed that complete malingering is very rare. Gross malingerers ought, if possible, to be convicted and punished; but he was afraid that would have very little effect in preventing partial malingering and valetudinarianism, and that, after all, as one of the speakers had said, was the important point. He was glad to hear that Dr. Dickson's large experience amongst miners completely confirmed the views which he (Dr. Bramwell) had expressed many years ago. In his book on the *Spinal Cord* he had discussed the subject of concussion of the spinal cord, and had referred to the procedure which should be followed in dealing with compensation cases; he agreed with Dr. Paterson's remarks on this point. There ought, of course, to be no difficulty in arriving at the facts of the case, and there would be no difficulty if the medical men on the two sides were equally qualified to give an opinion on the particular case under observation. But unfortunately this is often not the case. A surgeon, for example, may be asked to give an opinion on a difficult nervous case, or a medical jurist, who has no experience either of practical medicine or practical surgery, on a difficult medical or surgical case. Under such circumstances differences of opinion are apt to occur, not only as regards conclusions but as regards facts. In an eye case, if Dr. Paterson was on one side and Dr. Sym on the other, they would no doubt agree as regards the facts. What was required

was surgeons for surgical cases, neurologists for neurological cases, oculists for ocular cases, and so on.

Dr. Chalmers Watson had suggested some plan of co-operation between the doctors and the insurance companies in order that appropriate treatment might be applied in hospital during the early stages. Possibly that might be of some use, but in his Dr. Bramwell's experience the great majority of these cases, even when taken into hospital and properly treated, did not get well so long as the question of compensation was pending. Many of these patients make no effort to get well. Unless a patient made a vigorous and determined effort to get well he did not get well. There were, of course, lawyers who "cooked" these compensation cases; he had known at least one doctor who did the same thing.

The question of hysteria was a somewhat difficult one. Under the head of "hysteria" a large variety of cases was included. In some of them there was a strong desire to excite sympathy; in some the patients deliberately produce skin lesions with the object of exciting sympathy. It was difficult to draw the line between these cases and malingering. He did not think that patients of this kind ought to be put on the same level as patients suffering from organic disease; but no doubt in the great majority of cases of hysteria the patient was just as deserving of sympathy as a patient who was suffering from organic disease. The great majority of patients suffering from hysterical paralysis, for example, and hysterical contracture, were most anxious to get well.

The point which Dr. Sym made with regard to the difficulty of patients who had been accidentally injured and compensated getting work was an important one. He Dr. Bramwell cordially agreed with Dr. Paterson's remarks. There was, of course, a strong tendency in the human mind to try to find a cause for any and every illness; and if a person has received an injury, even some time before the development of an illness, he, not unnaturally perhaps, attributed the illness to the injury. Poliomyelitis anterior acuta was a striking illustration in point. It is now known to be an infective condition; formerly it was thought to be the result of injury, and in cases of poliomyelitis anterior acuta nurses were often blamed for supposed injuries to the child who developed the disease.

Dr. Bowie would have liked something more said with regard to prevention; he (Dr. Bramwell) was, however, speaking with regard to the position under the National Insurance Act as it actually existed, not as it might be amended. In the *Edinburgh Medical Journal* for December 1912 (p. 483) attention is directed to the fact which Dr. Bowie mentioned, that in some countries direct contributions towards medical benefit are imposed on sick insured persons. Without doubt, if such contributions were sufficiently large, malingering and valetudinarianism would be to a large extent prevented.

DIRECT LARYNGOSCOPY, TRACHEO-BRONCHOSCOPY, AND ŒSOPHAGOSCOPY.

An Account of the Direct Method of Examining the Larynx, Trachea, Bronchi, and Œsophagus; with some Illustrative Cases.

By A. LOGAN TURNER, M.D., F.R.S.E., F.R.C.S., Surgeon, and
J. S. FRASER, M.B., F.R.C.S., Assistant-Surgeon, Ear and
Throat Department, Royal Infirmary, Edinburgh.

II.

ŒSOPHAGOSCOPY.

Anatomy.—Killian has shown that there is a tonic and sphincter-like occlusion at the mouth of the œsophagus, at the level of the lower border of the cricoid cartilage; this is brought about by the lower fibres of the inferior constrictor muscle. Beyond the mouth the cervical portion of the œsophagus appears as a closed tube on direct examination. The lumen of the œsophagus is almost straight in the living, so that when the tube has once passed the cervical portion one can see almost to the hiatus œsophageus. The left wall of the œsophagus is related to the aorta, while the trachea above, and the heart at a lower level, lie immediately anterior to it. The pulsations of the heart and aorta may be seen on œsophagoscopy. The lower portion of the œsophagus curves forwards and to the left and comes to lie almost in front of the aorta, the cardiac orifice of the stomach being situated from 3 to 5 cm. to the left of the middle line. It is possible in many cases to pass a straight tube into the stomach, but the gastroscope has a slight angle at the lower end. The mobility of the œsophagus varies, being greater in thin than in stout people, while the position of the cardiac orifice depends on the position of the stomach.

The length from the upper incisor teeth to the mouth of the œsophagus is 15 cm. in men and 14 cm. in women. The cardia in men is from 36 to 50 cm. from the upper central incisors (average, 40 cm.), while in women the measurement is from 32 to 41 cm. (average, 36 cm.). The mouth of the œsophagus can be dilated up to 30 mm., but as a rule the tubes passed should not exceed 14 mm. in diameter. Stark gives the following figures:—

	Teeth to Cricoid.	Teeth to Bifurcation of Trachea.	Teeth to Cardia.
2 Years	10 cm.	15 cm.	23 cm.
10 ,,	10 cm.	18 cm.	28 cm.
15 ,,	14 cm.	23 cm.	33 cm.
Adult	15 cm.	26 cm.	40 cm.

Stark gives the transverse diameter at about 23 mm. and the antero-posterior at 17 to 23 mm. In infants a 7 mm. tube should pass freely into the œsophagus. The cervical portion of the œsophagus is closed and appears as a transverse slit, which opens up a little ahead of the tube. Respiratory movements cause it to open and close.

Preliminary Examination of the Patient.—This should include a careful examination of teeth, mouth, and pharynx. The larynx should also be examined by the indirect method. The movements of the palate should be noted, and also any tendency to the accumulation of food in the pyriform sinuses.

The ordinary medical examination of a case should always be carried out before direct œsophagoscopy, especially the examination of the heart and lungs. Auscultation during the swallowing of fluid may give a hint of the presence of stenosis, but more reliable evidence may be obtained from a radiogram taken while the patient swallows bismuth porridge or a solution of barium sulphate. Some surgeons believe that von Eicken's hypopharyngoscopy should be practised as a preliminary to the direct examination of the œsophagus, but the former procedure is more difficult for the surgeon and quite as disagreeable for the patient. The patient's neck should be examined for enlarged glands. Radiograms of the chest in cases of œsophageal stricture should be taken with the patient in an oblique position. After bismuth has been given, the dilatation of the œsophagus above a cancerous stricture is seen to be cupoliform, whereas that above a cicatricial stenosis is conical.

There is considerable dispute as to whether bougies should be passed as a preliminary to the direct examination. Some surgeons hold that if the case appears from the history to be one of spasmodic stricture, it is allowable to pass bougies. Others hold that in no case should bougies be passed unless under the control of vision, that is to say, through the œsophagoscope. Certainly in cases of foreign bodies or suspected malignant disease the bougie should not be passed; firstly, because the bougie may push down the foreign body in front of it, and secondly, because bleeding, due to the passage of the bougie, may interfere with direct examination afterwards. Kahler holds that the bougie is not satisfactory and is dangerous in cases of aneurysm; it may miss a slight stenosis, and gives little or no clue to the cause of the trouble.

Indications for Œsophagoscopy. —Foreign bodies, cicatricial contractions, malignant disease, cervical or mediastinal tumours press-

ing on the œsophagus, cases of spasm or paralysis, dilatations and pouches.

Contra-Indications.—Aortic aneurysm, cirrhosis of the liver, on account of the danger of bleeding from dilated coronary veins, severe heart lesions, phthisis pulmonalis, severe bronchitis, and arteriosclerosis.   It must be stated, however, that in cases of foreign body in the gullet these contra-indications do not apply, as œsophagotomy has a mortality of from 12 to 20 per cent.

Technic.—Direct examination of the œsophagus is always unpleasant, and is much more tiring for the patient than tracheoscopy.   Œsophagoscopy should, if possible, be carried out when the patient's stomach is empty.   Preliminary administration of morphia and atropine has already been referred to.   If the examination is to take place under local anæsthesia, the pharynx must be sprayed with 10 per cent. cocaine.   Thereafter the hypopharynx, including the pyriform sinuses, is painted with 10 per cent. cocaine under the control of the laryngoscopic mirror.   This painting must be carried out two or three times, and the patient should be asked to swallow, so that the brush or cotton-tipped probe may be able to pass downwards towards the œsophagus.   The patient must, of course, be asked to spit out any excess of cocaine.   He should be told that he will feel a sensation of swelling in the throat and have difficulty in swallowing, but that these feelings will soon pass off.   General anæsthesia should only be used in children, very nervous patients, and prolonged examinations.   It must be deep enough to obviate straining.

The question of employing general anæsthesia is one which depends almost entirely upon the psychology of the patient.   It is interesting to note that in Germany local anæsthesia is used almost entirely, whereas in America a general anæsthetic is necessary in nearly every case.   Wylie gives 15 grains of bromide and 3 minims of tincture of belladonna four times daily for three days before the examination in order to allay spasm and prevent excessive secretion.

Position of the Patient.—The sitting posture is far easier for the surgeon, but it is only suitable for brief examinations.   For prolonged operation the patient should lie on an operating-table, which is covered with felt to prevent him slipping off.   Further, the table should be raised by props to such a height that the operator, when seated, can look easily into the patient's mouth. Two positions are used—dorsal and left lateral.   In the former the assistant sits on one side and supports the head, which hangs

PLATE V.

FIG. 1.

Showing mouth of œsophagus and
posterior part of larynx.

FIG. 2.

Skiagram of chest taken from behind, showing halfpenny in
cervical œsophagus.

over the end of the table, the operator being seated behind the patient. When the left lateral position is used the operator stands facing the patient, while the assistant sits behind him. Brünings advises the left lateral position, and introduces the tube from the lower corner of the mouth; later the patient may be moved into the dorsal position. Whichever position be used the knees should be drawn up so as to straighten the spinal column. A second assistant is necessary to hand instruments and to look after the saliva pump.

Introduction of the Tube.—It is unnecessary to use a gag. Some surgeons employ a mandarin tipped with rubber in order to facilitate the passage of the tube, but it is probably better to avoid this procedure and to carry out the whole examination under the direct control of vision. The tube must be warmed and oiled. The patient lies in the left lateral position and breathes regularly while his head is supported by the assistant. The tube is passed through the mouth and over the epiglottis into the pharynx and gently pressed on into the interval between the arytenoid cartilages and the posterior wall of the hypopharynx (Fig. 1, Plate V.). Forward pressure with the distal end of the tube is now brought to bear on the back of the larynx so as to open up the hypopharynx and mouth of the œsophagus. At this point slight rotatory movements of the tube are of assistance. If at any time the operator is in doubt, he must go back again to the arytenoid region. Positions where pressure occurs are—(1) the upper incisor teeth, and (2) the cricoid cartilage. In order to obviate the latter the patient must be told to swallow so as to relax the sphincter at the mouth of the œsophagus. If the ordinary tube fails to pass, a smaller one must be used. It is very important that the surgeon should see and follow the lumen of the pharynx and œsophagus all the time. When once the mouth of the œsophagus has been passed the tube slides down rapidly through the cervical portion into the roomy thoracic section of the gullet. It is very important to gain the confidence of the patient and to assure him that if he raises his right hand the examination will be at once stopped and the tube withdrawn. If a gap exist in the upper row of teeth, advantage may be taken of it.

Appearances on Examination.—The cervical œsophagus is closed for 5 cm. beyond its mouth, and on passing the tube the lumen appears as a transverse cleft. The closure of the cervical part is due to the backward pressure of the trachea, but this part dilates in front of the tube, so that the walls of the œsophagus can be seen

well in advance. The outer portion of the œsophagoscopic tube is
long enough to reach down to the roomy thoracic portion of the
gullet, which has a more or less quadrilateral lumen. In order to
examine the lower part of the œsophagus the inner tube must be
introduced and passed gently downwards towards the cardia. In
order to see the lateral walls of the gullet the distal end of the
tube must be moved from side to side as it is passed down.
To reach the stomach the distal end must be pressed forwards
and to the left. At the lower end the hiatus appears as an
oblique cleft and, just before entering the stomach, the cardia
presents the appearance of a rosette.

During œsophagoscopy two bulgings upon the left anterior
wall in the neighbourhood of the tracheal bifurcation can be seen.
The upper one pulsates and is due to the arch of the aorta, the
lower one is the impression caused by the left main bronchus.
During œsophagoscopy sluggish peristaltic waves may be observed
passing down the œsophagus and obliterating the lumen during
their passage. It takes six seconds for a wave to pass from the
mouth of the œsophagus to the cardia.

On examination the œsophagus appears as a smooth tube and,
in the thoracic part at least, the lumen is wide and quadrilateral.
This condition has been attributed to the passage of the tube
allowing the atmospheric pressure to act on the walls and also to
the negative pressure within the thorax. Brünings, however, has
found that on introducing a tube, closed at the upper end with
a piece of glass, the thoracic œsophagus still appears as a large
smooth-walled cavity, and he therefore thinks it probable that this
part of the œsophagus normally contains air or gas which has been
swallowed with the food and driven back into the œsophagus by
the positive pressure in the stomach. The lumen of the œsophagus
may be seen to expand on inspiration and contract on expiration;
for this reason it is advisable to ask the patient to take deep
breaths during examination.

There are four regions in which the normal œsophagus shows
narrowing of the lumen, and these are also the principal sites for
pathological stricture of the œsophagus — (1) cricoid, (2) aortic,
(3) bronchial, (4) diaphragmatic.

The first is situated at the mouth of the œsophagus, which
appears as a transverse slit and is always closed in adults, but in
children it gapes during inspiration. The second, the aortic con-
striction, is seen on the left wall, and is very marked in children.
At the lower end of the œsophagus—the hiatus œsophageus—the

gullet curves forward and to the left. The hiatus must not be mistaken for the cardiac orifice or junction of the œsophagus with the stomach. The distance from the hiatus œsophageus to the cardia is about 5 cm. This part of the œsophagus is made up by the diaphragmatic and abdominal portions of the tube. The gullet is lined by pinkish and the stomach by dark red velvety mucosa.

The colour, normally, resembles that of the inside of the cheeks, but varies with the source and intensity of the light used from a pale greyish-pink to dark red.

Retrograde Œsophagoscopy.—The removal of the tube often reveals more than its introduction. It is very important to withdraw the tubes, both inner and outer, very slowly, and to carefully examine the walls during the process. In this way we are able to obtain a good view of the constricted portions, and especially the region of the mouth of the œsophagus.

Difficulties.—(1) The patient has a sensation of *choking* when the tube is passed behind the larynx, but he should be warned of this beforehand and asked to breathe regularly and swallow during the passage of the instrument. (2) *Saliva and mucus* are very apt to accumulate and hide the view. They must be got rid of by the saliva pump or by mops, but in some cases it is necessary to wash out the œsophagus. This can be easily done if the patient is in the lying position with the head low and the feet high. (3) *Bleeding* may occur, especially in cases of tumour. This trouble can be avoided by gentle manipulation and by the application of adrenalin. (4) *Partial ankylosis of the jaw* may be overcome by chloroform, but ankylosis of the vertebræ may render the examination impossible.

Dangers.—No attempt must be made to force a tube through a stricture. The latter can almost always be observed with the tube at a distance of half an inch above it. The region of the stricture can be cleansed, and, if necessary, a piece removed for microscopic examination. Other dangers are the breaking of a tooth, severe or fatal bleeding in cases of aneurysm, and rupture of the œsophagus.

After-Treatment.—If abrasions of the mucous membrane have been produced they should be painted at the time of examination with nitrate of silver (5 per cent.). The patient must be kept quiet after the examination; if this has been at all severe he should be confined to bed for a day or two until all danger of œsophagitis and peri-œsophagitis has passed. The patient should only take sterilised liquid food for the first twenty-four hours.

Occasionally, after the removal of a foreign body, there is a slight degree of œsophagitis, which usually subsides in a few days. If perforation of the œsophagus has already occurred, and if mediastinitis is present (as evidenced by fever, increasing pain, and surgical emphysema), it is useless to perform a direct examination.

AFFECTIONS OF THE ŒSOPHAGUS.

Foreign Bodies.—Jackson remarks that the days of the coin-catcher and the probang are, or should be, over. Out of thirty-two cases of "foreign body" in the œsophagus treated by the old methods during the years 1907-1910 eight were fatal and twenty-four recovered (Jefferson Faulder).

Foreign bodies which have been in the œsophagus for some time may be concealed by granulations and by swelling of the mucous membrane : the application of cocaine and adrenalin and the use of the probe are of assistance. Ninety per cent. of foreign bodies stick in the upper part of the œsophagus, and at least 60 per cent. are seen, on radiography, to be above the level of the manubrium.

Cicatrices.—The patient gives a history of having previously swallowed a corrosive fluid, but the stricture may only develop some years later. Even with such a history direct examination may show that the stricture is due to cancer. According to Brown Kelly strictures due to swallowing of corrosive liquids are situated at the lower part of the œsophagus. There may, however, be several strictures. Simple strictures may also be due to such operations as extirpation of the larynx.

Pouches.—Pouches from the œsophagus are practically always due to contraction following the cicatrisation of diseased bronchial glands, and are generally found just below the level of the bifurcation of the trachea, on the anterior aspect of the gullet. As a rule they have a wide opening and a pointed fundus. The latter is nearly always on a higher level than the opening, and hence food does not tend to collect in the cavity. These pouches are usually discovered by accident, during œsophagoscopy. In the pharynx, on the other hand, pouches are due to herniation caused by stricture below the level of the pouch. Their diagnosis is fairly easy, and is usually made by the patient, who notices a swelling in the neck during the course of a meal. This swelling is usually on the left side, and is situated at the level of the cricoid cartilage. Some patients can empty the pouches themselves, but in any case they must be kept clean by syringing after meals,

as otherwise fermentation is apt to take place and give rise to great discomfort. If, in these cases, a radiogram be taken after a bismuth meal valuable evidence may be obtained. During direct examination of such a case the tube spatula readily passes into the pouch, but of course no lumen is visible when the bottom of the pouch is reached.

Dilatations of the Œsophagus.—These are usually spindle-shaped, and may be due to stricture below, or to atony of the walls of the gullet. In marked cases during œsophagoscopy the walls of such a dilatation are seen to balloon out during inspiration, so that they cannot be seen through the tube. The dilated walls in such cases may show erosions. In alcoholic patients the walls may show evidence of chronic œsophagitis, *i.e.* dilated vessels and tenacious mucus.

Malignant Disease.—Waggett says that in three out of four cases stricture of the gullet is due to malignant disease.

According to Gottstein there are three forms of cancer of the œsophagus — (1) thickening with whitish patches alternating with bright red areas; (2) an annular constriction with a fungating ulcer above it; (3) a papillomatous and vegetative form. It is impossible to lay too great stress on the early recognition of these cases, and it is not too much to say that *no case of difficulty in swallowing should be regarded as hysterical without direct examination of the gullet.* Even if nothing is seen at the first examination the patient should be told to come back again in a couple of months, if the symptoms continue, for a further examination.

In addition to the forms of malignant disease above mentioned, cancer may occur outside the œsophagus and press upon the walls of the tube. In this last form the lining membrane appears normal on examination, but there is a densely hard bulging of one or more of the walls.

Cancer of the cardiac end of the œsophagus ranks next in frequency to that of the pharyngeal end. Even in the early stages of cancer of the lower end there is marked spasm, and there may be blood in the vomited matter. The symptoms are— (1) delay in the passage of solids and liquids into the stomach; (2) discomfort or pain in the epigastric region, which may radiate to the back, shoulders, or arms; (3) regurgitation of unchanged food; (4) loss of flesh; and (5) profuse secretion of saliva. If ulceration be present the case is, as a rule, easily diagnosed on direct examination, but it may be mistaken for peptic ulcer. On the other hand the submucous type of cancer may closely

resemble spasm of the gullet, as, on examination, one sees a smooth bulging into the lumen; later, however, this becomes nodular and eventually ulcerates, and the mobility of the parts is greatly diminished.

Tumours, etc., Pressing on the Œsophagus.—In cases of marked enlargement of the thyroid gland there may be narrowing of the cervical portion of the gullet. Tubercular glands may press on the gullet in the region of the bifurcation of the trachea, while malignant disease of the mediastinal glands may occasionally narrow the œsophagus. Dilatation of the heart may cause narrowing of the gullet, especially in cases in which the left auricle is involved. Other causes of stenosis of the œsophagus are lordosis of the cervical vertebræ and aortic aneurysm.

Hypertrophy of the muscular wall is very rare, and is probably congenital; it occurs in the cardiac region.

Paralysis of the gullet is also rare. In this condition the patient is unable to swallow solids, though liquids pass easily; a bougie may, in such cases, be passed without difficulty into the stomach. The œsophagoscope is also easily tolerated, as the walls are insensitive.

Spasm.—This is often associated with other diseases of the gullet. In cases of pure spasm, on direct examination the hiatus œsophageus appears like the os uteri, and there is no dilatation of the lumen during inspiration and no bubbling up of fluid or gas. If the tube be maintained in position for a little time and then gently pressed onwards the spasm relaxes and the instrument glides into the stomach. The examination should be carried out in the lying posture, and is greatly facilitated by the application of cocaine.

Although a large number of cases complaining of pain or difficulty in swallowing have been examined, and a diagnosis of malignant disease of the œsophagus has been made in some of them by this method of examination, only a few illustrative examples are recorded here. The subject of cancer of the œsophagus will be dealt with separately by one of us (A. L. T.) on a future occasion. The cases reported here illustrate the detection of malignant disease and the removal of foreign bodies.

Case I.—Mrs. B., æt. 37, was referred for examination by Mr. Wallace in November 1910. She complained of difficulty and pain in swallowing of eleven months' duration. Examination of the pharynx and upper air-passages revealed nothing abnormal. Œsophagoscopy under local anæsthesia (A. L. T.) demonstrated behind the cricoid

cartilage a fleshy-looking vascular infiltration on the posterior wall of the gullet, the most prominent edge of which was covered with a white slough. No attempt was made to pass the tube through the stricture, but a small piece of tissue was removed. Microscopic examination revealed a squamous epithelioma.

A circular area of the œsophagus containing the tumour was removed by Mr. Wallace, and a feeding tube introduced through the lower angle of the wound in the neck. Two years after the operation the patient remains in excellent health.

Case II.—Mrs. T. P., æt. 49, complained of difficulty in swallowing of four years' duration. She had no pain ; there was no bleeding and no alteration of the voice. Indirect laryngoscopy showed slight swelling of the arytenoid region. Œsophagoscopy (J. S. F.) revealed a cauliflower-like pinkish-fringed growth just above the mouth of the œsophagus. A piece was removed for microscopic examination and reported on as a papilloma. Two further examinations by œsophagoscopy confirmed the first. As the patient's appearance suggested a malignant condition Mr. Struthers operated upon her at Leith Hospital, removing about 1½ ins. of the œsophagus. This area of tissue contained a large circular ulcer which had caused a stricture of the tube. The microscope showed it to be a malignant condition. A feeding tube was introduced into the lower end of the wound in the neck. Good recovery.

Case III.—Male, æt. 57, was referred for examination by Mr. Hodsdon. He had complained of difficulty in swallowing of some months' duration : he had lost flesh. His symptoms were referred to the lower end of the œsophagus.

Œsophagoscopy under local anæsthesia (A. L. T.). The tube met with no opposition at the upper end of the gullet. At a distance of 38 cm. from the upper incisor teeth the lumen of the œsophagus was seen to be filled by a large villous-like growth occupying mainly the left side of the tube. No attempt was made to ascertain its vertical extent, but a small piece of tissue was removed for microscopic examination. This, however, proved to be too superficial to allow of a diagnosis being made. The naked-eye appearance of the growth, however, admitted of no doubt as to its malignant character.

Case IV.—H. S., aged 7 years, was seen on the 28th August 1912. Patient had a halfpenny in her mouth six days ago, when somebody made her laugh, and she swallowed it : since then she has had pain and difficulty in swallowing, especially solid food. Radiography revealed the foreign body at the level of the episternal notch. An injection of morphia and atropine was given about an hour before examination, which was carried out under chloroform anæsthesia. Brünings's tube, No. 2, was passed down through the mouth of the œsophagus (J. S. F.), and the coin was seen lying transversely in the cervical gullet. The coin,

which was a new one and had a raised edge, was easily grasped with Brünings's forceps and removed along with the tube spatula, as it was much too large to be drawn into it. The patient was kept in hospital for three days and made a good recovery. No dysphagia or rise of temperature was noted.

CASE V.—G. M'R., aged 4 years, swallowed a halfpenny on 12th September 1912; boy is imbecile and subject to "fits." Since swallowing the coin he cannot take solid food, and cries all day long. Admitted 17th *September* 1912.—Morphia and atropine given at 3.30 P.M., and at 4.30 patient put under chloroform. Brünings's No. 3 tube passed, and halfpenny discovered lying transversely at upper end of œsophagus (J. S. F.). After a little difficulty, due to the forceps slipping, the coin was extracted along with the tube spatula. It was afterwards seen that the coin was an old one, and that the edge had become worn down. 18th *September* 1912.—No fever; no pain. Patient swallows sterilised water apparently without pain. 19th *September* 1912.—Patient doing well; can take porridge. Sent home.

CASE VI.—J. L., male, aged 30, was admitted 25th August 1909. He stated that at 4 A.M. on the morning of admission he had swallowed a small tooth-plate to which one artificial tooth was attached. He had gone to bed perfectly sober, but woke up with a sensation of choking, and found that his artificial teeth had disappeared. He never takes his plate out at night. In spite of a careful search in the bedroom the plate could not be discovered. Originally it had had two teeth attached to it, but one had come out. The plate was the size of a shilling, and was originally fixed by two hooks to neighbouring teeth, but one wire had lately broken through. Local anæsthesia. The largest size of Brünings's tubes (No. 1) was passed with patient in the sitting position (J. S. F.). The tooth-plate was easily seen in the cervical œsophagus a little below the cricoid constriction. The hook of the plate was firmly fixed in the right lateral wall of the œsophagus, so that it could not be pulled up. Attempts to rotate it failed, and therefore the plate was pushed down into the roomy (thoracic) part of the œsophagus, so that it might be turned round. Unfortunately the long extraction forceps were out of order, and while these were being put right the tube was withdrawn. When next the tube was passed it was found that the plate had slipped into the stomach. Patient was put to bed and fed on porridge to which short pieces of Berlin wool were added. On 28th August (*i.e.* 3 days later) the plate was passed *per rectum*, surrounded with the wool. Good recovery.

CASE VII.—V. T., æt. 8, swallowed a halfpenny on 6th July 1912. The child was admitted to the Ear and Throat Department seven days later, and a radiogram showed the coin lying just above the manubrium sterni (Fig. 2, Plate V.). Attempts had been made elsewhere to extract it by means of a coin-catcher, but they failed to remove it. The child

complained of great pain and looked ill. The temperature was 102·6 F., and the pulse and respirations were much accelerated. There was some surgical emphysema of the neck. Notwithstanding the child's serious condition it was thought advisable to attempt the removal of the coin. Under chloroform œsophagoscopy was carried out (A. L. T.). On introduction of the tube into the œsophagus a large quantity of blood-stained, foul-smelling, purulent fluid at once began to flow through the œsophagoscope, interfering considerably with the examination. The fluid was seen to escape from a large area of very vascular granulation tissue. This was carefully probed with the end of a pair of extraction forceps, but the coin could not be detected. In the light of the child's general condition, and the evident perforation of the œsophagus with abscess formation, it was not thought wise to prolong the examination. During the night a further quantity of the fœtid fluid was brought up. Death occurred suddenly on the following day. Unfortunately a post-mortem examination could not be obtained. In all probability ulceration of the œsophagus had been followed by a septic inflammation in the cellular tissue round it, with extension to the posterior mediastinum. There was no evidence of pneumonia, nor was any purulent material coughed up. Jackson reports a case of a cent piece impacted in the œsophagus for two months, which was followed by ulceration into the trachea. In the case just recorded, where the halfpenny had only been lodged for seven days, it is more probable that the wall of the gullet had been torn by the coin-catcher used in attempts at extraction.

We are indebted to Messrs. Baillière, Tindall & Cox for permission to reproduce Figs. 1 and 2, Plate II.; Fig. 2, Plate III.; and Fig. 1, Plate IV., from Brünings's *Die direkte Laryngoskopie Bronchoskopie und Œsophagoskopie*, translated into English by W. G. Howarth, F.R.C.S., 1912.

TREATMENT OF SYPHILIS BY SALVARSAN.

By A. P. MITCHELL, M.D., F.R.C.S.,

Late Clinical Assistant, Lock Wards, Royal Infirmary, Edinburgh.

MUCH has already been written on this subject, and some of the recent reports have grossly exaggerated the dangers attending the use of the new remedy. It is difficult for one who is not intimately acquainted with all the details and facts concerning a new form of treatment to wind his way through the various and often very contradictory opinions. But if by sifting the observations which are of practical importance and presenting a synopsis of our results with an unbiassed view of the situation the medical practitioner is helped in assuming a proper attitude

towards the most modern method of treating syphilis, the object
of the following paper has been attained.

I have used salvarsan since January 1911 and have, along
with Mr. Dowden, administered fully 350 injections. 268 of the
patients were male and 56 female; 271 were in the primary
and secondary stages, 42 were in the tertiary stage, 2 were
cases of incipient general paralysis, and 9 were cases of con-
genital syphilis.

The frequent mildness of the disease in females explains the
remarkably small number that sought treatment.

Preparation of Salvarsan Solution.—The salvarsan solution for
all the injections has been prepared by Mr. Alexander, dispenser
to the Royal Infirmary, and to him I am indebted for the
following notes :—

Contents of salvarsan tube (0·6 grm.) transferred to sterile 100 c.c.
measure, moistened with ½ c.c. 90 per cent. alcohol and 50 c.c. of
0·5 per cent. saline (sterile) added. A perfectly clear solution having
been obtained, add carefully 15 per cent. solution of sodium hydroxide
(sterile) until the precipitate first formed is redissolved, leaving a
perfectly clear solution free from haziness (fully 1 c.c. of sodium
hydroxide). Filter if necessary with precautions through sterile wool
and make up to 300 c.c. with 0·5 per cent. saline.

For transfusion, 400 c.c. 0·9 per cent. saline (freshly prepared) is
supplied with each dose.

I would also advise that the solution be prepared by a
competent chemist, and be sent in a clear glass bottle or flask,
so that the slightest opalescence or deposit can be easily detected.

I cannot recommend the use of neo-salvarsan ("914"), as I
found the solution to decompose with great rapidity.

Preparation of Patient and Technique of Administration.—It is
advisable that on the evening before the injection the patient
should receive a purgative, and in the morning his breakfast
should be restricted to a cup of tea and slice of toast. I
have followed this plan throughout, and to it in some measure
attribute the mild reactions that most of the patients have had.

Salvarsan in special preparation has been administered by
injection into the muscles.

It is now generally agreed that the best way is by intravenous
injection, and this method I have solely employed except in two
early cases. No unpleasant local symptoms need arise with appro-
priate technique, which is very simple. There are many forms of
apparatus on the market, most being absurdly complicated. All

that is required is an ordinary transfusion apparatus (as shown in Fig. 1)—glass barrel, rubber tubing, clip, and hollow metal needles (blunt and sharp).

The patient lies on a table and a piece of elastic webbing is fastened high up round the upper arm to render the veins (median basilic and median cephalic) prominent. The skin at the bend of the elbow is sterilised by painting with tincture of iodine. The most prominent vein is selected, preferably the median basilic, which
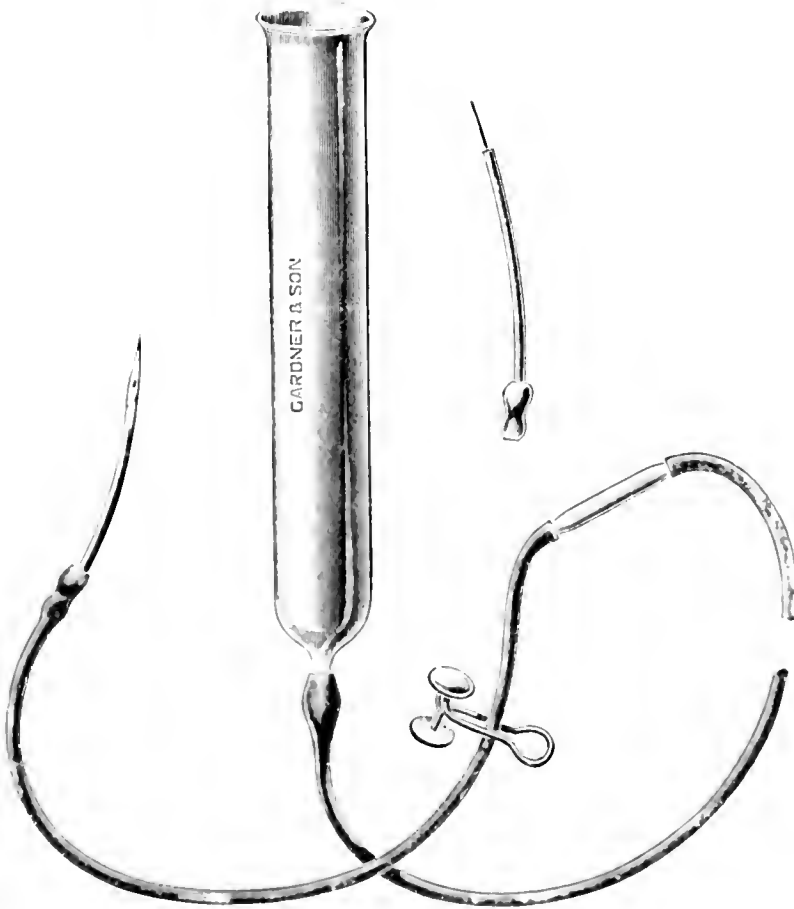
Fig. 1.

I have found invariably to permit of the most rapid transfusion. The vein may be made more prominent by asking the patient to clasp and unclasp his hand. It is necessary to exercise certain precautions to ensure that the needle is actually in the vein before the salvarsan solution is introduced, because the escape of any of the drug into the subcutaneous tissues gives rise to a localised necrosis or inflammatory swelling round the vein. To guard against this the apparatus is filled with saline, the entrance of air bubbles being prevented by raising the needle end till most of the tubing is above the level of the barrel, slowly lowering the former with clip open while the solution flows through, and then

closing the clip when the contained saline stands about 3 inches from the bottom of the barrel.

The puncture should be made deliberately rather than in a stabbing fashion. Steady the vein with the left thumb and slide the needle, with its eye upwards, along the thumb nail and insert it through the skin in a direction parallel to the selected vein, which is entered obliquely. After some experience it is very easy to tell when the point of the needle is in contact with the smooth inner coat of the vein. Should the needle have gone through or only wounded the vein, a subcutaneous hæmatoma will form at once, or if the needle has missed the vein a swelling will form at the site of injection when the saline is turned on, which is done by removing the tourniquet, raising the barrel to about 3 feet above the patient, and releasing the clip.

Supposing the vein to have been struck, an ounce or so of saline is allowed to run into the circulation, the clip being closed when the salt solution stands almost at the bottom of the container. The solution of salvarsan is then poured into the barrel, either adding it continuously and slowly, or filling and refilling it, and when the last portion has almost reached the bottom of the container about an ounce of saline is poured in on the top of it to ensure that the full dose is washed into the circulation. The saline is added slowly, and the barrel held obliquely to prevent the formation of air bubbles.

Should the needle have missed or transfixed the vein it must be withdrawn and another vein selected on the same or opposite arm. If no prominent vein is available for puncture, then it is necessary to expose the selected vein by dissection under local anæsthesia, ¼ per cent. novocain solution being employed endermically. It is extremely inadvisable to choose the vein already tried for puncture, as the resultant hæmatoma renders the isolation of the vein difficult. The use of a hollow metal needle with blunt point greatly facilitates its introduction into the vein, and it is well to open the vein by sharp-pointed scissors, cutting obliquely, thus producing a triangular aperture.

The veins in women are often so small that dissection is frequently required; the veins, however, in men invariably become larger and prominent after application of the tourniquet, and the selected vein can be " struck " in at least 90 per cent. of cases.

In babies I have found the external jugular vein the most suitable. It is most easily exposed where it crosses the posterior border of the sterno-mastoid muscle, the incision necessary being

not more than 1 inch in length. The first catgut ligature is applied to the cardiac end of the exposed vein. The internal saphenous vein was not tried, as my experience in the cadaver showed its isolation to be most difficult.

Dosage.—In some measure the dose depends upon the general condition of the patient. I considered it advisable, in the case of adults who were feeble and looked ill, to administer half the usual dose for intravenous injection, viz. 0·3 grm. (4½ grains), and if no ill effects followed this, to give in 10 days or a fortnight later the full dose—0·6 grm. (9 grains). In ordinary cases of syphilis, where the patient was otherwise healthy, I have always administered 0·6 grm. as a first dose both in males and females. Children have received 0·1 to 0·3 grm. (1½ to 4½ grains)— approximately 0·005 to 0·01 grm. per kilogram of body weight. In suckling children (6 to 9 months) doses of 0·02 to 0·05 grm. have been employed with much success.

Repetition of the Dose.—This will depend upon the clinical course of the case and the effect upon the Wassermann reaction. Should a second injection be decided upon, it ought not to be administered until at least ten days after the first, thereby avoiding the risk of acute arsenical poisoning. A full dose (0·6 grm.) is not wholly eliminated until about a week.

It is very exceptional for a single dose of salvarsan to cure a case of secondary syphilis; in fact a cure as determined by the Wassermann reaction may not be obtained even after several injections.

Bearing in mind the latency of syphilis and its tendency to relapse, I resolved *ab initio* to supplement the salvarsan injections by moderate doses of mercury. The period during which this must be carried out will be determined by the course each case runs and the state of the Wassermann reaction. The mercury was administered, as a general rule, in the shape of pills.

The giving of small tonic doses is the secret of successful treatment with mercury.

Effects of an Intravenous Injection.—At the time of intravenous injection I have noted the following in a few cases:—(1) Præcordial uneasiness; (2) slight degree of dyspnœa; (3) exacerbation of headache; (4) metallic taste in mouth; (5) general flushing of the skin. In the majority of cases there is a definite reaction, but of extreme variability. I have never witnessed any of the alarming symptoms which have been made so much of by the adverse critics of the remedy.

In a small percentage of cases, especially if the usual preparation has not been carried out, the patient may vomit very soon. Symptoms, when they do arise, usually begin from 1 to 3 hours after the injection. One of the most frequent is a feeling of chilliness, which sometimes amounts to a definite rigor, and this may last for an hour or so. The temperature reaction varies considerably; commonly it does not rise above 99° F., but in some cases it may rise to 103 or 104° F. In any case it usually falls to normal within 12 hours. Several reasons have been given to explain the rise of temperature :—(1) The dead bodies of the spirochætes or their liberated endotoxins ; (2) toxins produced in the saline as the result of bacterial action; (3) solution of salvarsan itself.

In my experience, extending over nearly two years, I have seldom noted the temperature raised above 100° F., and attribute the mild reaction to (1) the preparation of the patients; (2) the careful preparation of the salvarsan solution, and the use of saline freshly prepared and sterilised; and (3) the technique of administration. In a few cases diarrhœa occurred, but ceased in a couple of days.

Most of the patients complain of headache and a feeling of nausea. There is a temporary loss of appetite. Within 36 hours practically all the ill-effects have passed off, and the patient expresses his sense of well-being.

The rapid disappearance of all clinical signs of the disease is very remarkable. Primary lesions heal in a week or ten days, the sore always assuming a healthy healing appearance in a couple of days or so. I considered it advantageous to apply hot fomentations to extremely hard indurated sores for a few days previous to the injection, on the principle of increasing the local blood-supply, and so probably ensuring a more thorough penetration of the salvarsan.

Secondary rashes fade in a marvellous manner. There may be a temporary exacerbation of the skin lesion (the Jarisch-Herheimer reaction), viz. increasing in depth of colour. Not infrequently papular rashes remain as pigmented spots for weeks. Mucous lesions of the mouth and throat heal quickly. It is in tertiary ulcerations that the drug is particularly useful, and its value most strikingly seen. They assume a healthy appearance within 48 hours. and in some cases are completely healed within a week.

Headaches or pain of any kind arising in the course of syphilis are usually greatly benefited.

In malignant syphilis, which as a rule reacts very slightly to mercury, the drug produces very marked benefit (*vide* Case V.). Fortunately I have met with no cases of blindness following the use of the drug, but, on the other hand, have successfully treated cases of syphilitic choroido-retinitis, neuro-retinitis, and iritis.

There is rapid disappearance of the albumin in syphilitic nephritis. The beneficial effect on the general health is marked in the great majority of cases. There is frequently a gain of weight to the extent of several pounds in a month. The changes noted in the composition of the blood are not constant. Usually the number of red corpuscles and percentage of haemoglobin is definitely increased. The benefit in cases of syphilitic anaemia is often strikingly marked, the pallor and sallowness disappearing in a few weeks. That the effects enumerated are due to the destruction of the specific parasite is proved (1) by the rapid disappearance (24 to 48 hours) of the *treponema pallida* from the various local lesions from which, previous to the injection, they were easily obtained; and (2) by the effect on the Wassermann reaction. It is unreasonable to expect much improvement in cases of para-syphilis where the nerve tissue is obviously degenerated.

That immunity is not produced by salvarsan is proved by records of the disease having been contracted a second time.

Ill Effects.—Not a single case of the series has been attended with any serious ill effect, and I can unhesitatingly state that no case has given me the least anxiety. It is very unfortunate that the idea has got abroad that salvarsan may not uncommonly lead to fatal results and damage to the optic nerve.

Regarding blindness, Ehrlich says: "I have not had a single case of blindness reported to me, and despite penetrating research it has not been possible for me to run one of the rumoured cases to earth." Wechselmann also, in upwards of 1200 cases in which he has used salvarsan, has been unable to detect any injury to the optic nerve.

Considering the large number of injections that have been given throughout the world, the mortality percentage becomes fractional. It seems rather odd that a great many of the fatal cases recorded should have occurred in France. If some of these had been labelled as "death from acute arsenical poisoning" or an "overdose of salvarsan by too early a repetition of the drug" the description would have been much more accurate. It is often the administrator and not the drug that is to blame, a faulty technique

having been employed or all well-known contra-indications disregarded.

Relapses.—It is not surprising that relapses occur after treatment by salvarsan when it is remembered that syphilis under any form of treatment may remain quiescent for long periods and suddenly break out again. It therefore follows that many months or years must elapse before an accurate estimate can be formed as to the potency of salvarsan as a curative agent. When relapses do occur they are usually easily cleared up by another injection.

Contra-Indications.—These are very few and have gradually diminished as our knowledge has increased with experience in administration of the drug. Tuberculous lesions, optic atrophy, and diabetes are no longer considered contra-indications. It is considered inadvisable to employ salvarsan in intracranial lesions, *e.g.* gumma, and in advanced degeneration of the central nervous system. Further, it is conceded that cases with cardiac lesions and nephritis (non-syphilitic in origin) should not be subjected to the treatment. Pregnancy is not a contra-indication.

Effect on Wassermann Reaction.—The Wassermann reaction enables us to follow the fluctuations of the disease apart from all its objective manifestations. I have met with considerable difficulty in inducing patients to return for blood examination, and this accounts for the small proportion of cases in which the reaction has been determined. There can be no doubt that the combined treatment produced more quickly a change in the Wassermann reaction.

I have obtained the following results in 80 cases where the reaction could be followed for several months :—

In 71 cases after one intravenous injection the Wassermann reaction was negative in 49 and positive in 22.

In 4 cases after two intravenous injections the Wassermann reaction was negative in 3 and positive in 1.

In 2 cases the reaction relapsed from negative to positive, and in 5 it remained unchanged.

It is well known that soon after a return of the reaction to positive, symptoms appear, and this must be regarded as an indication for further treatment. In my experience I have found that a negative reaction was soon obtained in early primary cases if, in addition to a combined treatment with salvarsan and mercury, they have had as a preliminary excision of the primary sore. If the change of reaction is any indication of the efficiency of the treatment, then I consider the plan I have followed in

these cases will favour an earlier cure. Further than this, it emphasises the importance of early diagnosis and treatment. Finally, I would recommend the tests to be carried out by a competent person, otherwise the results may be very erroneous, and also that a series of reactions be determined at one, three, six, nine, and twelve months after treatment.

Comparison with Mercury.—I have found that salvarsan in its action on syphilis at all stages is unquestionably more rapid and powerful than mercury. This is well illustrated by its immediate effect on those cases which have been treated by mercury alone for a considerable period and still show such clinical evidence of the disease as persistent mouth and throat lesions or rapidly advancing tertiary ulcerations. (*Vide* Case III.)

Whether it will ever replace mercury remains to be seen, but after the results I have related there can be little doubt that the routine use of salvarsan in conjunction with mercury should be adopted in all cases of syphilis.

The following cases will suffice to indicate the remarkable properties of salvarsan :—

CASE I.—A clerk, aged 26. Primary sore 18 months ago, and usual mercurial treatment carried out in Glasgow. In spite of this he was referred to me in May 1911 for serious manifestations of the disease in his eyes. His vision was very poor—$\frac{6}{16}$ in each eye—so much so that he required to be led into the ward. There was a certain degree of iritis in the left eye, and both fundi showed haziness of the media, with recent changes in the retina and optic nerve head. On 24th May 1911 he received an intravenous injection of 0·6 grm. of salvarsan. The reaction was marked and he complained of severe pain in his eyes. Within three days there was a distinct improvement in his vision, and the tired sleepy feeling had gone from his eyes. At the end of a week the vision in each eye had risen to $\frac{6}{9}$, but the ophthalmoscopic appearances remained much the same as before the salvarsan. Within three months of the injection he was able to resume his usual work as a clerk.

CASE II.—A printer, aged 38. Primary infection 20 years ago. When seen by me he had been suffering from extensive ulceration of the palate for some months. He was much emaciated, his complexion was a dirty sallow colour, and he was rather feeble. The odour of his breath was somewhat foul. There was a large oval ulcer on the hard palate, with a dirty greyish sloughy base. On 22nd November 1911 I administered an intravenous injection of salvarsan (0·6 grm.). The reaction was very slight. When he reported a few days later he remarked he felt like a young man. The base of the ulcer was much

cleaner—showed a large piece of necrosed bone. Two months after the injection a flat discoloured sequestrum was easily removed from his palate. There was a small communication with the nasal cavity. A fortnight later the ulceration of the palate had healed, the only defects being two tiny perforations and slight nasal speech.

CASE III.—A hairdresser, aged 32. Primary sore 5 years ago. Had a very vigorous course of mercurial treatment carefully carried out from the beginning, and in spite of this repeated relapses. His palate first troubled him two years after the primary infection. A similar ulcerative process with much crusting affected the anterior nares about the same time. So resistant was the condition to drugs, *e.g.* soamin and arsan, that X-rays were given a trial. No benefit resulted from this. Tuberculin ointment was next employed as a positive von Pirquet cutaneous reaction had been obtained. This likewise failed to effect any improvement. By the time he was referred to me, on 22nd December 1910, the ulcerative process was spreading to the upper lip, and the patient had become very melancholic owing to his hideous appearance. It is not to be wondered at that he immediately consented to receive an intramuscular injection of salvarsan (0·6 grm.) on 12th January 1911. The reaction was moderate. Within a fortnight the palate and nose had absolutely healed, fortunately with very little scarring. On 25th October 1911 we administered an intravenous injection of salvarsan (0·6 grm.) as his Wassermann reaction was still positive. Since then his reaction has remained negative, and there has not been the slightest evidence of a relapse.

CASE IV.—A clerk, aged 30. The primary infection was eleven years ago. On examination there was practically nothing but the soft parts of the nose left, and the ulcerative process had extended through to the alveolar margin of the upper jaw. The destruction was so great that it was possible to look straight into the antrum.

An intravenous injection of salvarsan (0·6 grm.) was administered on 18th October 1911. The reaction was mild. At the end of a week remarkable improvement had taken place, the raw surfaces having assumed a healthy healing appearance. Commencing contraction of the anterior nares was noticed, and five weeks from the date of the injection there was considerable contraction, and complete healing had occurred. The resultant deformity was very slight after three paraffin injections had been given.

CASE V.—A blacksmith, aged 48. Date of primary infection uncertain. He was referred to me on 17th July 1911. About two months before he was seen by me he stated that he accidentally scratched his penis with a pin when lifting a stone. Eight or ten days later the abraded area increased in size, and three weeks before admission a rash appeared, first on his ankles, and gradually spread over the whole body. On examination I found on his legs a profuse purpuric rash, pustular

and black in centre, probably the result of scabbing. Size varied from a pin head to scabbed sore as big as a sixpence, with red area around. The right eye was affected with iritis and scleritis. The glans penis was eroded, and the prepuce was destroyed to a great extent by marked ulceration. The rash did not resemble syphilis, being too red and inflamed, and there was absence of mouth symptoms. Scrapings from the penis and pustules showed no spirochætes but *staphylococcus aureus* (pure growth obtained and vaccine made). No benefit resulted from vaccine. Patient looked very ill, and it was decided to try a small dose of salvarsan. Accordingly on 29th July 1911 I administered 0·3 grm. intravenously. The reaction was marked, the temperature rising to 102° F. The effect was remarkable, the skin lesions within a few days having assumed a healthy healing appearance, and the general condition of the patient much improved.

On 8th August 1911 he received a full dose of salvarsan (0·6 grm.). The reaction was very slight. Within a week most of the symptoms had completely vanished.

> CONCLUSIONS.—1. Salvarsan has the most striking and rapid effect on all the clinical manifestations of syphilis.
>
> 2. Salvarsan produces a more rapid change in the Wassermann reaction than mercury.
>
> 3. The period of infectivity is greatly reduced by the disappearance in a few days of all spirochætes from the superficial lesions.
>
> 4. The dangers of death, blindness, and other nerve lesions have been grossly exaggerated.
>
> 5. I strongly recommend the routine use of salvarsan in conjunction with mercury in all stages of syphilis, beginning with an intravenous injection of salvarsan and following it with a course of mercury, and, if necessary, repeating the salvarsan injection.
>
> 6. The intravenous route is the only satisfactory method.
>
> 7. Treatment should be controlled throughout by the Wassermann reaction.
>
> 8. It has a striking effect on lesions that have resisted mercury.
>
> 9. The use of neo-salvarsan is extremely dangerous on account of its great instability.
>
> 10. Bad effects are due to faulty preparation and administration.

My grateful thanks are due to Mr. Dowden for his kind permission to utilise all the cases under his charge.

CLINICAL RECORD.

A CASE OF TUMOUR OF THE BREAST, RECURRENT SIX TIMES DURING A PERIOD OF THIRTY YEARS.

By DAVID M. GREIG, C.M., F.R.C.S., Senior Surgeon,
Dundee Royal Infirmary.

THE subject of the following condition was a widow aged 71 at the time of her death. She was unable to give any details of her family history. Her only child died in 1896, aged 40, of jaundice. The story she gave strongly suggested a malignant origin. Except for the breast trouble the patient had always been strong and healthy, a splendid type of a hardy Highlander. In 1872 she was struck on the left breast by a horn of a cow and to this she naturally ascribed the appearance, eighteen months later, of a little hard nodule about the inner quadrant of the breast. Towards the end of 1873 this nodule was excised by the late Professor Annandale. Eight years later, 1881, the growth having recurred, Professor Annandale again operated, and this time removed the entire breast. She was then free from trouble for seven years, and in 1888 a third recurrence took place, and for the third time Professor Annandale operated with a view to the entire removal of the new growth. She stated, and the scar indicated that she was probably correct, that on no occasion was the axilla included in the operation. By 1889 she had passed into other hands, and a fourth recurrence was removed by Professor MacEwan and Dr. Templeman. In 1894 a nodule appeared in front of and below the clavicle. This was freely movable to begin with, she said, but became fixed as it gradually increased in size. When she first came under my observation in 1898 she was a healthy, hearty-looking woman, quite able to do her housework and attend to lodgers as her means of livelihood. Indeed it was her preoccupation in this way that had brought about delay in submitting to operation. The tumour was then an oval swelling, with its long axis measuring six inches directed obliquely downwards and inwards. It started as a projection above the middle of the left clavicle and passed in front of the bone down to the lower border of the pectoralis major where that muscle passes from the chest to the axilla. The skin over this tumour presented some telangiectasis and there were several large veins. The tumour was in no part hard, but, on the contrary, exceedingly soft, and in places suggested fluctuation. The tumour had all the appearances of a sarcoma. It was excised in May 1898 and was found to consist of two parts, each being soft and encapsuled and slightly lobulated. Though there was no evidence of involvement of axillary glands it was thought advisable to remove these, as the original tumour was described as being hard, that being the only point which suggested carcinoma. Though the part below the clavicle was emucle-

Recurrent Tumour of the Breast in a Female æt. 71, Showing Outgrowths, Local Infiltration and Ulceration in the Final Stages of the Disease.

ated intact the adhesions of the upper part caused some tearing of the tumour, which was very friable and bled readily. The wound healed by first intention, but five months later she was complaining of pain in the left shoulder, and about one and a half inches from the outer end of the clavicle a vaguely-defined soft swelling had appeared above the clavicle, and as this bone seemed to be involved, both it and the tumour were removed together. It was found necessary to remove also the coracoid process of the scapula, as it was obviously affected, and the tumour was observed to have extended underneath the pectoralis major. Complete eradication was plainly out of the question. This operation was followed by much greater relief than could have been expected. The wound healed well and the movement of her arm appeared to be limited only by the axillary cicatrix of the operation of May 1898. This condition of well-being continued for several months, but towards the summer of 1900 a local recurrence again appeared. As the growth increased she became more and more incapacitated for housework, and ultimately had to give up keeping lodgers, and by November had become unable to attend to herself and she was admitted to the Royal Victoria Hospital for Incurables. Here she remained until her death in October 1903. She had thus during a period of thirty years suffered the original tumour and six recurrences, the longest interval between operations having been nine years.

The immediate cause of death seemed to be debility, which was accompanied with marked emaciation, and was doubtless hastened by eighteen months' recurring hæmorrhage from several small ulcerated patches on the tumour. Some of these hæmorrhages were very considerable. The condition of the tumour towards the end of her life is shown in the accompanying photograph. There was a good deal of œdema of the left upper extremity, but the tumour retained its character as a soft, nodular, ill-defined infiltration, under a skin discoloured by telangiectasis and purpled by venous engorgement.

For some weeks before death, pains in the chest, lower limbs, and other parts of the body, indicated a probable vertebral involvement, but on post-mortem examination the mass was found to have perforated the thoracic wall and extended on to the pleura and along the line of the ribs, while down the spine were many secondary growths, no one of any great size. The extension seemed to have been entirely by continuity and not by lymphatics or vessels. The appearances in the pleural cavity reminded one of the implantation nodules on the peritoneum from rupture of a malignant ovarian cystoma. The spine, if affected, seemed to have been so entirely from without, but the ribs were soft and easily cut with a knife, suggesting possibly a malignant osteomyelitis. That the condition was one of sarcoma I had no doubt. The nature of the recurrence, the appearances of the tumours as I saw them, the growth from rounded bases, the softness of the masses, the

encapsulation in the earlier stages, and the absence of glandular involvement all pointed, I thought, to sarcoma; and it came rather as a surprise to me when Professor Sutherland reported it to be an alveolar carcinoma, from the examination of the entire specimen obtained post-mortem.

It was more than a surprise, it was a distinct shock, to be told that the condition was one of alveolar carcinoma. Not only was I unprepared for this diagnosis by the microscope, but it upset every conception I had of the characteristics of carcinoma. Of course I had not seen the original tumour, nor for that matter several of the recurrences, but to find a recurrence characterised by soft, nodular, smooth masses, with a marked tendency to hæmorrhage on little injury, surrounded by dilated vessels, and shining, hæmorrhagic and discoloured, through the epidermis; to find on operation that the masses were encapsuled, even though too extensive in the deepest parts to permit removal; to find that no glands were affected; to find that later on extension only took place by infiltration and infection by continuity, made one but admire the pathologist's reliance on the accuracy of his observation. I pressed Professor Sutherland very hard on the point, but he persisted that the tumour was an alveolar carcinoma, and examination of fresh sections only confirmed him in the correctness of his view.

It may be one of the penalties paid for the prominence now given to pathology that references to such recurrences as characterised this case are few and far between. Bland-Sutton,[1] in his book on *Tumours*, makes no mention of them. Treves,[2] to whom curiosities and anomalies seem to have an attraction, does not refer to them, and when one turns to special works on malignant diseases in general or diseases of the breast in particular one is almost equally disappointed. Neither in the consideration of carcinoma nor sarcoma of the breast does Butlin[3] refer to recurrences prolonged during many years, but of carcinoma he writes that "cases are on record in which the primary disease has been in existence for as many as ten or more years without any obvious enlargement of the axillary glands." I have at present under my observation such a case, where neither supra-clavicular nor axillary glandular involvement can be made out in a woman aged 76 whose large fungated carcinoma has existed during eight years. Handley[4] writes: " It is probable that not infrequently permeation may smoulder along the lymphatics without giving rise to macroscopic nodules in its course. In such cases long periods of apparent immunity may be followed by recrudescence of the growth at some distant point, towards which in the meantime the process of permeation has steadily been creeping in a latent and microscopic form. A rational explanation is thus afforded of the unsolved mystery of recurrence after many years of quiescence and apparent cure." Shield[5] gives three cases of carcinoma of the breast when repeated operation was ultimately successful

in entirely eliminating the disease. One was alive seventeen years after operation for her third recurrence. Another was well at 72 after twelve operations for recurrence, though she had only been two years clear at the time of the report. The third is not convincing. She was operated on in 1837, again in 1838, again in 1839, again in 1842, and died in 1892 at the age of 82, having been free from breast trouble for forty-nine years. The question is, Were pathological methods sufficiently advanced in 1837-1842 to make the recognition of carcinoma unequivocal? But these cases are perhaps beside the mark, for they point rather to the success of repeated removals and to the absence of glandular affection than to any extraordinary latency between recurrences. Another class of case is that in which a long period elapses between the primary operation and the recurrence, but these also cannot be compared with the case under consideration, for the explanation can be offered that they are not true recurrences but really fresh attacks of carcinoma. There is not wanting evidence in Shield's[6] book that frequency, recurrences, and comparatively long life may occur in sarcoma.

One must look amongst the older writers to find full reports of recurrent tumours. The recurrences appealed more to them than the pathological details, while in quite modern times the reverse may be said to be the case. Indeed there may be perhaps a present-day tendency to belittle the value of macroscopic appearances and of clinical characteristics. West[7] mentions in some detail "recurring fibroid" of the uterus, but the malignancy was established by secondary deposits in the lungs. This of course might be at the last a degeneration. Some of the writers lay emphasis on the fact that the tumour becomes more malignant with each recurrence. The border-line between innocent and malignant tumours may be exceedingly narrow. This similarity has been convincingly emphasised by Cathcart.[10] Paget,[8] in his *Lectures on Surgical Pathology*, contributes a most interesting chapter on "recurrent tumours." Undoubtedly all of the tumours he describes as "recurrent fibroid tumours" would now be classed as sarcomata. Spence[9] records the history of a case of recurring tumour in a woman who was first affected at the age of 19, and who had the tumour removed three years later. It recurred a year later "in the form of three small tumours situated in the cicatrices." These tumours and the scar were removed, but eighteen months later her third recurrence took place, and this, too, was removed. She then had a considerable period of relief, and it was not until twenty years after the removal of the third growth that she had to be operated on again. Eleven years later the final attempt was made to remove the recurrence. Five operations had thus been done during a period of thirty-eight years, the first indication having been in 1830, and her death taking place in 1871. Spence speaks of this as a "fibroplastic" tumour. He was much struck by

the length of time his patient retained her general health unimpaired while suffering from time to time from local recurrence, and he concludes his chapter as follows: "I am therefore strongly inclined to consider it a tumour *sui generis*, the type of a class whose peculiarity is the tendency to recurrence without constitutional degeneration."

I would not venture to suggest a tumour *sui generis*, but merely point out the rarity and interest of the recurring growths, and urge the necessity for a fuller pathological investigation during their existence than I was able to obtain in my case.

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OBITUARY.

THE LATE GEORGE ALEXANDER GIBSON, M.D., LL.D., F.R.C.P.E.

WITH profound sorrow we record the death of Dr. George Alexander Gibson. The announcement will bring to Edinburgh men all over the world, and to many besides, a sense of close personal loss. It is given to few men, as it was to Gibson, to attract and to keep attached so wide a circle of friends and admirers. He was a great, large-hearted human. Everything pertaining to humanity was of interest to him. He believed in men, he loved men, and he was loved and trusted in return.

"He played on men, as his master, Phœbus, on strings, melodious."

George Gibson came as an undergraduate to Edinburgh in the early seventies. He had not been long athwart the University horizon before he was a marked figure. In these days the impression he created was that of a healthy presence, full of force and fascination. He was conspicuous in the varied pageants of student life, whether of sport or earnest. At the Societies he showed himself valorous and chivalrous. He knew how to give and receive the doughty blow. And so his fellows made him president of the Dialectic Society and president of the Royal Medical Society.

Later it looked as if Edinburgh might lose him, for in 1878, within two years of graduation, he was appointed assistant-physician to the Birmingham General Hospital. But the lure of Edinburgh prevailed. He returned to plunge into the heart of things as teacher,

GEORGE ALEXANDER GIBSON.

physician, and citizen. He was recognised quickly as a serious worker, a man of fine ideals and big outlook, an insatiable reader, a sound and generous critic, and a capable original observer. Appointment after appointment fell to his lot in the school, the hospital, and the city.

Gibson was a cultured physician in the broadest sense. This is seen abundantly in his numerous and varied writings. His sharp vision and quick imagination gave him a remarkable power of orientation in presence of new facts and ideas. Intricate problems were illuminated by bright flashes of illustration from other fields of science and from the well-trodden garden of literature. To his students he made the subject live. The truth was enriched in form and colour by his easy reference to parallel facts in nature or to like ideas in the classics of the past or the present.

An ardent student of the history of medicine, he delighted in tracing the evolution of medical knowledge and opinion in different departments. Few men could touch him in accuracy of recollection. His clear and retentive memory enabled him to cite chapter and verse for every reference.

Gibson's medicine was based on a broad, firm foundation of anatomy and physiology, and he built widely. He was no narrow specialist. If his chief devotion was to the heart and circulation, this came naturally to a man who had been George Balfour's house physician. The early love grew to be the passion of his life. With boundless, untiring energy he studied the immense literature of circulatory disease, and accumulated a vast store of personal observations. He became one of the best known authorities on cardiac pathology and therapeutics.

It is one of the pathetic coincidences of human life—a fact on which Gibson would sometimes dwell—that when illness came to him it centred in the circulation. For months he had occasion, in his own person, to watch the fluctuations in the movements of the marvellous machinery whose ways and moods had fascinated his keen, inquiring mind.

Happily he lived to become one of Scotland's most trusted physicians. The eagerness with which his opinion was sought by increasing numbers was a just and natural reward. His advice was asked by rich and poor, and to both alike he gave ungrudgingly of his best. The widespread confidence reposed in him made him supremely happy. And no less gratified was he with the rich harvest of academic honours which were showered on him from both sides of the Atlantic.

To know Gibson, in his capacious inwardness, meant to have been with him on holiday—whether on the sandy turf of Machrihanish or Gullane, or the deck of an ocean liner, or the pavements of Paris or Berlin. Wherever he went he was at home—the soul and life of his fellows. Bubbling over with vitality, he was a remarkable embodiment of the *joie de vivre*. The day was never dull nor the night long if George Gibson were of the company.

At the College of Physicians' dinner on the 17th January he was not with us. The presidential chair, which should have been his, was filled by another. In the quiet of the evening, in his own sweet home, surrounded by those he loved best—his devoted wife, dear companion of many happy years, his daughter, and his son returned that day from Western Canada—he lay recalling many things and many friends. He dwelt tenderly, gratefully, on the past, and spoke hopefully of the future, and then fell asleep. As the Fellows and their guests were leaving the Physicians' Hall the strong, gentle, generous soul passed from us. "The curfew of his life quivered on the evening air." The echoes of the presidential *Floreat res medica* were as the refrain to the loud human song he had sung while he was with us.

Four days later we laid him reverently to rest in that city of the dead where many of the best in medicine lie. A heavy shadow is over the city and the school. At many a turn we shall miss the tried colleague, the beloved physician, and the dear friend. But he remains with us in undying memory, and men will work the better and live the better because they knew George Gibson.   R. W. P.

I LEAVE it to others to write of the remarkable and many-sided career of Dr. George Gibson and of the distinguished place he occupied as a physician, but perhaps I may be permitted to add my tribute to the memory of a loyal and true-hearted friend and companion.

It is nearly thirty-six years since I was introduced to him by our common friend, the late Professor D. J. Cunningham, when we were enjoying a holiday on one of the most beautiful of our western islands, and since that autumn day our friendship remained unbroken, while my admiration for him gradually increased and my affection deepened.

It was impossible to help loving a man with such a big, generous heart and a temperament bubbling over with genuine kindness and good nature. His most outstanding characteristic was his breezy optimism, which was reflected in his buoyant gait, his bright, cheery countenance, and the hearty ring of his voice. It did one good to meet a man who gave one such a cordial greeting, who possessed to such an uncommon degree the joy of life, and had the power of infecting others with the same joyous outlook. No one could know George Gibson for any length of time without recognising that he was a big-souled man, generous to a fault, broad-minded and tolerant, and absolutely devoid of self-seeking in any shape or form.

His interests were wide and varied. He touched life at many corners, and he possessed the magnetic force of attracting deep and lasting friendships wherever he went, and from all sorts and conditions of men. To the many who, like the writer, had the privilege of his ministrations during times of sickness the memory of his unwearying care and attention and of his sympathetic kindness can never be effaced.

No man loved holidays better. Latterly he often spent them i

foreign travel, but he loved Scotland best He had visited nearly every corner of it, had climbed many of its mountains, golfed on most of its links, fished in many of its streams, and possessed a marvellous knowledge of its people and history. His hospitality was proverbial, and he never showed to better advantage than at his own table, where he was generally the life of the party, while his merry laugh and his endless stock of stories infected his guests with some of his own superabundant cheerfulness.

To his devoted and sorrowing wife, the sharer of all his honours and successes, the heartfelt sympathy of his many friends is affectionately tendered.

His loss to the profession he so greatly adorned is irreparable, while to the friends who loved him his passing means that the days which remain will be less full of sunshine and the shadows will be longer. Farewell, good friend ! You have made the world brighter and happier for many of us.   G. H. M. D.

TRANSACTIONS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A CLINICAL meeting was held in the Royal Infirmary on 18th December 1912, Mr. J. M. Cotterill, President, in the chair. Mr. Stiles showed—(1) A boy aged 1½ years, thirteen months after operation for *extroversion of the bladder*. The exposed mucous membrane was dissected off the wall of the bladder, then the abdomen was opened in the middle line, and both ureters were transplanted very obliquely into the pelvic colon on the Witzel gastrostomy principle. The raw surface of the bladder had been allowed to cicatrise over. (2) A case of *epispadias in a girl* aged 6 years. The child had suffered from incontinence of urine since birth. The anterior commissure of the vulva was absent. The clitoris was split, and each half was surrounded by a small horse-shoe preputial fold continuous with the anterior extremity of the labium minus. The treatment was transplantation of the ureters into the pelvic colon.

Mr. Wallace showed two cases after *neurectomy*. In the first, the spinal accessory had been divided and a portion removed for spasmodic wry-neck ; in the second, neurectomy of the inferior dental and infra-orbital on the right side, and of the infra-orbital on the left side, had been performed for very severe and intractable neuralgia.

Mr. Denis Cotterill showed a case of *congenital dislocation of the shoulder* which simulated a birth palsy.

Movements at the shoulder were fairly good, but were almost entirely scapular.

Dr. George Mackay (with Mr. Cotterill) showed a case of *hæmatoma of the orbit* cured by a modified Kronlein's operation, and (with Mr. Stuart) a case of *exenteration of the orbit for recurrent sarcoma*.

Mr. J. W. Struthers (with Mr. J. S. Fraser) showed a patient after *removal of a segment of the cervical œsophagus* for squamous-celled carcinoma. Mr. Struthers also showed a patient after nephrectomy for *acute unilateral suppurative pyelonephritis*.

Mr. Scot Skirving showed two male patients suffering from severe *tertiary*

syphilitic lesions under treatment with neo-salvarsan. Rapid improvement was taking place. In one case mercurial treatment had failed to produce much benefit, and had been badly borne. Mr. Skirving also showed charts illustrating the contrast between reactions following the use of salvarsan and neo-salvarsan. In the case of the latter there was less headache, sickness, and general discomfort. In the case of both drugs there was less reaction in women than in men. This was possibly to be accounted for by the fact that the women had been kept in bed for a day or two before the injection, while the men had not.

Mr. George Chiene showed a boy, aged 11, after operation for a *depressed fracture of a portion of the parietal bone*, and a woman, aged 35, after operation for removal of a *stone in the kidney*. The patient had been operated upon five years previously for acute pyonephrosis during the puerperium. In the course of a second pregnancy she had developed pyonephrosis again, but recovered without operative treatment.

Mr. Henry Wade showed cases illustrating the effects of *plastic surgery*.

Dr. Gulland showed a case of *senile chorea*. There were restless movements, speech affection, and delusions. There was no hereditary history. Dr. Gulland also showed a case of *pulmonary abscess*, and demonstrated the physical signs with the aid of Aitchison Robertson's multiple stethoscope. The patient had been taught to empty the cavity by assuming an inverted position and coughing.

Dr. R. A. Fleming showed a case of *acute toxic polyneuritis* which had supervened in a sailor ten weeks after he had been engaged in painting a ship's hold with naphtha paint. Dr. Fleming also showed a case of *syringomyelia*. The first symptom had been the development of *painful* whitlows. This was followed by fibrillary tremors and trophic sores, with spasticity and involvement of the right cervical sympathetic. The typical sensory symptoms were also present, as well as a curious vertical nystagmus.

Dr. Boyd showed two cases of *syphilitic spinal paralysis* and a case of *purpura hæmorrhagica*.

Dr. John Thomson showed a case of *oxycephaly* Patient was a girl aged 11. There was the typical peaked cranium and facies. The eyes were very prominent, due to the shallowness of the orbits. There was slight postneuritic optic atrophy, and there were peculiarities in the ocular movements. Contrary to the usual condition the mental capacity of the child was good. Dr. Thomson also showed a child with mild *cretinism* in which remarkable improvement had followed the use of thyroid extract. She had doubled her weight in four months and tripled it in thirteen months.

Dr. J. S. Fowler showed a case of *sarcoma of the liver* in a child aged 9.

Dr. Edwin Bramwell showed three brothers, aged 33, 31, and 27, suffering from *myotonia atrophica*. The leading features were indistinct articulation, bilateral facial weakness, atrophy of sternomastoids, weakness of hand movements, and difficulty in relaxing the grip—a difficulty which was overcome by repetition of the movements. There was no marked atrophy, no fibrillar tremors, but the tendon jerks were diminished.

Dr. Rainy and Mr. Dowden showed a patient who had suffered from *hæmorrhage from the colon*. An exploratory operation had shown the colon thickened and covered with small subserous hæmorrhages. Complete recovery followed a course of lavage with protargol.

Mr. George Chiene, Mr. J. M. Cotterill, Dr. Hewat, Dr. Boyd, and Mr. Miles showed specimens.

Scottish Otological and Laryngological Society.

THE Society met in the Royal Infirmary, Edinburgh, on Saturday 30th November 1912, Dr. J. S. Fraser in the chair.

Drs. J. S. Fraser and Raymond Verel submitted a report on 76 consecutive operations on the *nasal accessory sinuses*. Of these 11 were fronto-ethmoidal, 52 antral and antro-ethmoidal, 3 ethmoidal, 6 spheno-ethmoidal. There were also operations on four dentigerous cysts. Some of the patients were shown. Discussion chiefly dealt with the method of treating antral suppuration, the general opinion being that where washing out the antral cavity did not lead to a cessation of the discharge resort should be had to the Caldwell-Luc operation, by which in the great majority of cases a cure could be confidently anticipated. The intra-nasal operation did not receive much favour.

Dr. Fraser gave a lantern demonstration of the pathological changes in various stages and types of *labyrinthine suppuration*—serous labyrinthitis, fibro-purulent labyrinthitis, purulent labyrinthitis (manifest and latent), healed labyrinthitis. He also showed a patient operated on by Mr. J. W. Struthers for *epithelioma of the hypo-pharynx*. A somewhat similar case operated on by Mr. Wallace two years ago was shown by Dr. Logan Turner.

Dr. J. H. Gibbs contributed an interesting paper, illustrated by lantern slides and skiagrams, on "*Dental Surgery in its Relation to Rhinology.*" He discussed the association under four headings :—(1) Developmental defects, insisting especially on the importance of training young children to use well their muscles of mastication for the purpose of widening the dental arches and so increasing the width of the nasal passages. (2) Injuries, such as the passage of a tooth root into the maxillary antrum and fracture of the antral wall during dental operations. (3) Infection of the antral and nasal cavities from diseased conditions of the teeth. (4) Dental cysts and follicular odontomes.

Dr. J. Kerr Love gave a lantern demonstration exhibiting the production of both congenital and post-natal *deafness by congenital syphilis*. A number of family trees were shown. Dr. Carl Browning made some remarks on the Wassermann reaction in these cases. Although in some the child affected gave a negative reaction the syphilitic taint could be inferred from the positive reaction in one or more members of the same family not affected by deafness. This tended to confirm Dr. Love's opinion that the aural condition is the result of an expiring syphilitic virus.

Dr. Logan Turner showed (1) a boy with a large *keloid* involving the scar after the mastoid operation. Removed in January 1911 it returned, and was in July 1912 larger than before. (2) A young man on whom he had operated for *sarcoma of the tonsil*. (3) Four cases of *lupus of the nasal mucous membrane* treated with nascent iodine (Pfannenstiel's method). Sodium iodide was administered in small doses at first. At the end of a week the amount was 30 grains in 24 hours. The nasal cavities were then carefully cleaned and packed with strips of sterilised gauze. The patients were instructed to keep these plugs moist with a solution containing hydrogen peroxide and a small quantity of hydrochloric acid and perchloride of iron. The results were more satisfactory than those of other methods of treatment.

Dr. T. W. G. Ross read a paper on fifteen cases in which the bone cavity after the radical mastoid operation was treated with *scarlet red*, and showed several patients in illustration. Epithelialisation appears to be hastened by this method, though in the subsequent discussion scepticism was expressed as

to the high value placed on it by some, Dr. T. Barr remarking that the whole subject of the after-treatment of the radical mastoid operation was worthy of a full and careful discussion. Whatever method is adopted a *sine qua non* for a dry cavity well lined by epithelium is the closure of the Eustachian orifice, a matter of much difficulty.

Dr. Milligan reported a case of *naso-pharyngeal fibrosarcoma* operated on three years ago in which there has been no recurrence. The anæsthetic was administered through a Kuhn's peroral intubation tube, a valuable method in these large operations on the nose and naso-pharynx. Dr. Milligan also showed an *œsophageal pouch* removed by operation. Though thus designated, these pressure pouches are really of pharyngeal origin, the fault in the pharyngeal wall occurring just before its junction with the œsophagus. The pouch having been removed, the opening in the pharyngeal wall was closed by a double row of sutures. There has been no relapse, and the patient has gained in weight. Dr. Milligan also gave an account of a case of *traumatic perforation of the œsophagus* into the aorta with death from hæmorrhage. A rabbit bone had been swallowed ten days previous to the patient coming under observation. On œsophagoscopy no bone could then be found, but at the level of the bifurcation of the trachea a small granulation was seen. There was then no hæmorrhage. Two days later the young man died. On post-mortem examination a small patch of necrosis was found in the œsophageal wall. The adjacent mediastinal tissue was also black and necrotic, and the aorta was similarly affected in a small area in which there was a perforation. The specimen was shown.

Dr. Malcolm Farquharson reported a case of *chronic sinusitis* of the ethmoid and sphenoid associated with oculo-orbital symptoms. The patient, a woman, complained of frontal headache accompanied by swelling over the lower part of the forehead, eyelids, and upper part of right cheek of fortnight's duration. On examination there was found, in addition, proptosis of the right eyeball with diminution in its range of movement. The fundus and optic disc were normal, but vision was impaired. The frontal and antral cavities transilluminated well. Intra-nasal examination did not reveal pus or crusts. The patient was, however, advised to go into hospital for immediate operation. Three days, however, elapsed before she did so. The sight of the eye was then found to be almost gone, and on ophthalmoscopic examination it was seen that the edges of the disc were blurred and the vessels full, and the pupil did not react to light. Operation was carried out. The sphenoidal sinus and the spheno-ethmoidal cell were full of œdematous granulations, but there was very little pus. The frontal sinus was opened, but was found healthy. The vision improved somewhat, but later examination showed marked pallor of the disc and commencing atrophy. Movements of the eyeballs became normal. Dr. Farquharson also showed a man who had suffered from severe dyspnœa as the result of a large *cyst in the region of the right arytenoid and aryepiglottic fold*. The cyst was incised, but filled again and was again opened. It gradually disappeared under vocal rest and inhalations, and the movements of the cord slowly returned to normal.

Dr. J. D. Lithgow described an *intra-nasal radical operation* which he had devised for dealing with maxillary antral disease. In connection with it he showed a pair of mirrors for lateral intra-nasal rhinoscopy. The operation consists of two stages, and is performed under local anæsthesia. The first stage is the usual intra-nasal procedure—removal of the lower and anterior

part of the nasal wall of the antrum. If there is still discharge at the end of five or six weeks the second part of the operation is performed. This consists in the removal by means of scissors and snare of the anterior third of the inferior turbinal, together with a large part of the adjacent antral wall. The after-treatment can be carried out by the patient, and consists in spraying the antrum with peroxide of hydrogen, douching with saline and insufflating ½ per cent. solution of menthol in parolein. The cavity can be inspected with the aid of the lateral mirrors, and curettage can be carried out if necessary. Dr. Lithgow exhibited an *improved form of guillotine* for extracapsular enucleation of the tonsils by the Whillis-Pybus method, together with some tonsils removed by this instrument.

Dr. W. G. Porter showed two cases of *singer's node* removed by the indirect method, in the one case by means of Moritz-Schmidt's forceps, in the other by the cautery. The latter patient also had ozæna. This was treated by an autogenous vaccine of Abel's bacillus which was found in pure culture. Eighteen inoculations were given, ranging from 10 million at first up to 300 million, at intervals of a week in the earlier period and longer intervals in the later. The formation of crusts ceased and the odour disappeared. Dr. Porter also showed another case of ozæna similarly treated and with an equally satisfactory result.

Dr. John M. Darling showed a rare and interesting case of *pedunculated tumour attached to the anterior faucial pillar* and hanging down into the pharynx. A small piece removed was reported as being simple fibroma, but the appearance of the growth strongly suggested malignancy, a view in which the members concurred.

Dr. Brown Kelly showed a patient, a young man, suffering from *keratosis* of the larynx and trachea. There was no keratosis in the pharynx. On the anterior two-thirds of the slightly red left cord was an irregular white formation like curd, and on the anterior wall of the trachea were three or four white prominent points. The condition had remained unchanged for three months. Films prepared from the excrescence on the cord showed a few leptothrix filaments and small cocci or bacilli, while sections showed strata of flattened epithelial cells surmounted by broken strata similar to those of the cornified layer of the skin.

Dr. James Adam reported on the result of operation in a case shown at the previous meeting. There was then swelling in the region of the external walls of both superior maxillæ. On operation each antral cavity was found to be filled by a large *fibroma* undergoing osseous changes.

Skiagrams of the mastoid region were shown by Drs. Porter and Logan Turner, and the latter with Dr. W. T. Gardiner showed *pathological specimens* illustrating tuberculous ulceration of the trachea, syphilitic necrosis of the larynx, stenosis of the larynx after diphtheria and tracheotomy, meningitis secondary to sphenoidal sinus suppuration, frontal lobe abscess and meningitis secondary to accessory sinus suppuration and orbital abscess. Dr. H. H. Bolton showed a series of *cultures* of the bacillus proteus vulgaris.

It was arranged to hold the next meeting in the Victoria Infirmary, Glasgow, in May, under the chairmanship of Dr. Brown Kelly. Dr. W. S. Syme was re-elected Hon. Secretary and Treasurer.

Edinburgh Obstetrical Society.

THE third meeting was held on Wednesday, 8th January 1913, Dr. Haig Ferguson, President, in the chair. Specimens were exhibited by the President, Dr Barbour, Dr. Fordyce, and Mr. Scott Carmichael.

Mr. George Chiene read notes of a case of ruptured very early primary ovarian pregnancy, and demonstrated his remarks with lantern illustrations.

Having mentioned the causes of serious ovarian hæmorrhage, he then shortly referred to the literature on ovarian pregnancy. His own case was one of a married woman, aged 34, who was admitted to hospital supposed to be suffering from acute appendicitis, but the symptoms pointed rather to an internal hæmorrhage, and the question of a ruptured ectopic gestation was considered ; the menstrual history, however, was perfectly normal. A laparotomy was performed, and a large quantity of blood having been evacuated, a bulging mass, about the size of a cherry, was observed to be protruding from the uterine end of the right ovary. The ovary was rapidly removed, the patient made a good recovery, soon afterwards again becoming pregnant, and in due course gave birth to a healthy child. The ovary was cut in serial sections. Chorionic villi were present in the blood clot, but no fœtus was found, nor were there any signs of a corpus luteum, lutein, or decidual cells. The pregnancy was probably either one of ten or twenty-two days' duration.

Dr. Berry Hart then read his paper on " *The Duration of the Interval between Insemination and Parturition in certain Mammals as Studied in Biometric Curves, with Special Reference to the Calculation of the Onset of Labour in Human Pregnancy.*"

The statistics of Tessier in ewes, and in cattle by Earl Spencer and Tessier, relative to the interval between insemination and parturition, were first considered. The statistics in regard to 912 ewes gave a symmetrical narrow probability curve, like that of coin-tossing, where 50 are thrown for a certain number of times.

In the Tessier-Spencer cases, 1206 in all, the curve was similar but somewhat skew. The late Professor von Winckel gave the statistics in 245 cases where the infants weighed over 4000 grammes, and these gave also a probability curve, but one less narrow and with several peaks : it needed smoothing out. The greatest number of cases lay between the 284th and 288th days, reckoned from the 1st day of the last unwellness.

The author concluded that—

1. These cases gave a probability curve symmetrical in ewes, somewhat skew in cattle, and irregular in the human female so far as yet observed.

2. The initial date of calculation, in the human female, should be the 1st day of the last unwellness, and the date of labour would be some time in the fortnight containing the 280th day as its centre. Thus the date of labour could not be exactly stated, but was only a probability one.

3. Labour in von Winckel's cases was prolonged in some instances to the 334th day, and the whole range lay between the 240th and 334th.

4. This prolongation of date was usually considered as a prolongation of the duration of pregnancy, but it might be due to fertilisation of the ovum shed at the next period, and this would account for the prolongation in a simple way.

5. Some explained the prolongation as a real prolongation of pregnancy, and pointed out that in some of the cases the weight of the infants was much above the average. The evidence as to this was unsatisfactory.

6. There is certainly no exact number of days for the duration of human pregnancy, and the probable curve is as yet unknown.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., AND JOHN D. COMRIE, M.D.

SPOROTRICHOSIS IN MAN.

THIS subject has been frequently referred to in medical literature during 1912. Beurmann and Gougerot (*Les nouvelles mycoses*, Paris, 1912), Beurmann (*Brit. Med. Journ.*, August 1912), and Hamburger (*Journ. Amer. Med. Assoc.*), more particularly, have drawn attention to its increasing importance. Beurmann, by his clinical observations and his experimental researches, has established the condition on a firm clinical basis; and Hamburger, in his paper, has collected and analysed all the published cases in America. The most important result from these publications is that we now know that sporotrichosis is interesting not to the dermatologist alone, but also to the physician—that sporotrichosis is not only a localised skin affection, but may be a generalised systemic affection producing granulomata in muscles, bones, joints, eyes, kidneys, and lungs, etc. About 200 cases altogether have been recorded, and with the definite knowledge we now possess of its existence and clinical appearances it is probable that sporotrichosis will turn out to be a widespread affection, particularly in country and farming districts. In America, so far, the recorded cases have been localised skin affections, possibly because observers have not been aware that the condition attacks internal organs and tissues.

Beurmann in his paper classifies the clinical varieties as follows: (1) Localised sporotrichosis, with ascending lymphangitis. (2) Disseminated gummatous sporotrichosis—multiple subcutaneous nodules distributed without systemic arrangement throughout the body; early —small, hard, painless, round masses; late—soft, cold abscesses, small and large. No ulceration. (3) Disseminated ulcerative sporotrichosis —multiple ulcerations of the nature of tuberculous, syphilitic, ecthymatous lesions, or a mixture of these. (4) Extra-cutaneous sporotrichosis, with localisation in mucous membranes, muscles, bones, joints, ocular tissues, synovial membranes, kidney (one case), and lungs (two cases).

That these cases have been missed in the past is undoubted, probably because the lesions of sporotrichosis, whether cutaneous or extra

cutaneous, respond as readily to iodides as do syphilitic lesions. The diagnosis is not always an easy matter, and the condition in its various forms has to be differentiated from syphilis, tuberculosis, lipomatosis, etc. Hamburger in his paper indicates the main points that assist in its differentiation.

Clinical.—It occurs chiefly in men between 15 and 45, and chiefly in farmers, fruit and vegetable dealers, florists, etc. There is usually a history of antecedent trauma by nails, wire-knife, hammer, etc. The incubation period is long, and the appearance of the characteristic small, round, hard, subcutaneous nodules, and the subsequent softening into cold abscesses or ulcers, is slow and insidious. Infection is gradual, following the course of the deep lymphatics. There is no pain or temperature and no effect on the general health. There is a local and general eosinophilia. Eosinophils are found in the original nodule, in the pus from the abscess, in the circulating blood of experimental animals, and in the blood of actual cases.

The results of growing the sporotrichium are characteristic. The initial appearance of the growth is very slow ; it grows readily on 2 per cent. glucose agar, and presents a raised, corrugated appearance, with the production of blackish-brown pigment in old cultures. Its branching septate mycelium and pear-shaped spores are also diagnostic.

According to Beurmann, the prognosis is excellent once an accurate diagnosis has been made. If unrecognised, the cases last indefinitely under all forms of treatment. A diagnosed case is a mild affection lasting from four to six weeks. The only exceptions to this rule, Beurmann says, are those cases where the mucous membrane of the pharynx and upper air-passages has been invaded, or in cases where the mycosis develops on a cachectic or on a tuberculous soil, or in patients who cannot take iodides in any form.

The *treatment* consists in giving potassium iodide internally in increasing doses up to 6 grms. or even more in the 24 hours. The local nodules should be dressed with a weak iodo-iodide solution— water 500 grms., pot. iod. 10 grms., iodine 1 grm. The general treatment should be continued for a month after apparent cure to prevent recurrence. If patients are intolerant of the inorganic iodides the organic may be tried—sajodin, iodo-maisine, or iodopin. The local abscesses or lesions in bones or muscles should never be treated surgically. All such attempts have been unsuccessful.

BISMUTH POISONING.

Warfield (*Amer. Journ. Med. Sci.*, November 1912) describes a case of typical bismuth poisoning, and considering the number of reported cases and the increased use of bismuth either as a paste for injection into chronic sinuses or for X-ray work in the diagnosis of gastro-intestinal conditions, he is surprised that in no text-book on medicine

is there a discussion or even mention of it. Warfield's case occurred in a child of 9, who suffered from an ilio-psoas abscess. A sinus followed, into which bismuth paste had been injected. Ten months afterwards she began to show signs of bismuth poisoning. The symptoms and appearances correspond somewhat in their distribution to poisoning with mercury and lead, but are quite distinctive. The mouth is first of all affected. A line appears on the margins of the gums, differing from the lead line in being of a violet colour. It occupies all or part of one or both jaws. Stomatitis follows, usually acute, and accompanied by violet or violet-black spots or tattooing of the buccal mucous membrane. In the severer cases these tattoo-like plaques ulcerate and become covered in the centre by a whitish diphtheritic membrane. The ulceration and membrane formation often affect the sides of the tongue, as in Warfield's case. This ulceration and membranous formation is pathognomonic of bismuth poisoning. General symptoms are usually present. There is fever and malaise, with vomiting and diarrhœa. The patient looks ill and loses weight. There is albuminuria, sometimes with casts in the urine. The condition in the mouth may be severe. Mastication may be impossible, and the tongue may be so swollen and painful that it cannot be protruded. There is much salivation, and the ulceration may extend to the soft palate and tonsils and cause hoarseness.

Altogether there are reports in the literature of more than 20 deaths from bismuth poisoning, and numbers of cases of moderate severity which recover as Warfield's did. Warfield points out that at first it was believed that if bismuth produced symptoms of poisoning it was because the preparation used was impure and contained arsenic, lead, or antimony. Then one or two fatal cases were recorded following the use of bismuth subnitrate for X-ray examination, and experimental investigations were started. The fatalities had been ascribed not to the metallic bismuth, but to the nitrites which are liberated when the subnitrate comes in contact with fæces. They were thus called cases of nitrite poisoning. Experimental observations were made by various authors on dogs and other animals, where care was taken to use only chemically pure bismuth. Various salts of bismuth were employed, and all degrees of poisonous symptoms were produced, from the simple violet line on the gums to advanced lesions in the mouth, with ulceration and gangrene, and also systemic lesions in the kidneys and alimentary tract. These lesions were similar to what is produced in man. Most authors are now agreed that the symptoms described are due not to impurities or formation of nitrites, but to metallic bismuth. From the data he has collected—the experimental observations—Warfield is of the opinion that the indiscriminate use of bismuth subnitrate is not devoid of danger. In intestinal work it should be withheld in inflammatory cases where X-ray observations are to be

made, and if used as a paste for sinuses, care should be taken that the bismuth is gradually extruded. The carbonate or oxychloride of bismuth are much safer, as with them there is little probability of producing any symptoms, even with the large doses necessary for X-ray work in intestinal cases.

A New Reagent for Detecting Occult Blood.

Ruttan and Hardisty (*Canad. Med. Assoc. Journ.*, November 1912) urge the claims of a new reagent for detecting occult blood. Of chemical tests suggested and employed, benzidin has proved the most satisfactory ; but various objections have been urged against it, which the authors think are met by their new test. The substance used is tolidin or orthotolidin, a crystalline basic body of the aromatic series, very slightly soluble in water, easily soluble in alcohol and ether, and closely allied to toluidin and benzidin. The efficacy of this new reagent was proved against the usual chemical tests for blood in urine, fæces, and stomach contents—guaiacum, benzidin, and phenolphthalein. The relative delicacy of different reagents for *blood in watery solution* was as follows :—Guaiacum detected blood in dilution of 1 to 50,000, benzidin 1 to 700,000, tolidin 1 to 7,000,000, and phenolphthalein 1 to 10,000,000. Tolidin had a further advantage over guaiacum and benzidin in that the colour—a green to blue-black depending on dilutions—though not developing so rapidly, lasted very much longer and increased in intensity with time.

Blood in Urine.—Guaiacum and benzidin detected blood in dilutions of 1 to 6000, while tolidin detected it in dilutions of 1 to 24,000, giving a deep greenish-blue colour that lasted half an hour or more. Phenolphthalein detected blood only in dilutions of 1 to 2000. *In fæces* guaiacum showed blood in dilutions of 1 to 10,000, benzidin and tolidin 1 to 100,000, phenolphthalein 1 to 2000. *In stomach contents* guaiacum detected blood in dilutions of 1 to 5000, benzidin and tolidin in 1 to 30,000. The authors consider that their results demonstrate the superiority of tolidin for revealing occult blood. Benzidin, which at present is commonly used for clinical work, would seem to be as delicate as tolidin, but this only holds good for freshly-prepared solutions. Even when only 24 hours old, benzidin loses 50 per cent. of its delicacy, while tolidin will remain unchanged for 3 or 4 weeks. And again, when the blood to be detected is only in very small amount, the colour reaction with tolidin gradually increases in intensity and persists much longer than with benzidin.   E. M.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

TETANY FOLLOWING EXTIRPATION OF THE THYROID.

SHEPHERD (*Ann. Surg.*, November 1912) reports a case of tetany following thyroidectomy, and reviews present knowledge and theories regarding the functions, etc., of the parathyroid glands. His patient was a married woman, aged 34 years, in perfect health except for the presence of a large goitre. The greater part of the enlarged thyroid was removed by operation, and on the 5th day after operation marked symptoms of tetany appeared. Calcium lactate in drachm doses was given every 3 hours, and in a few hours the symptoms had almost disappeared. After 5 doses had been given the calcium lactate was stopped, and 2 days later the symptoms reappeared and were again markedly relieved by calcium lactate. The same sequence of events followed, and extract of parathyroid and thyroid glands was added to the calcium lactate. Three weeks after the operation the patient was well enough to leave hospital, but had to continue taking calcium lactate, as symptoms of tetany reappeared whenever it was discontinued. Parathyroid extract had little beneficial effect, and 6 months after the operation the patient was still obliged to take calcium lactate, although the symptoms were much less severe than at first. The thyroid removed was carefully examined and no parathyroids were found. Shepherd's case supports the view that the parathyroids control the calcium metabolism of the cells of the body and that their removal causes a rapid disappearance of the soluble salts of calcium from the blood, rather than the view that the parathyroids produce an antitoxin which neutralises waste products. The failure to control tetany with calcium lactate occasionally reported is to be attributed to the administration of too small doses. In connection with the operative technique Shepherd emphasises the difficulty or impossibility of recognising parathyroids on the operating table, for even in working on the cadaver nearly half the supposed parathyroids removed turn out to contain no parathyroid tissue at all. Hence the difficulty of successfully avoiding removal of parathyroids may be very great, and it is reassuring to know that tetany may be controlled by giving calcium lactate in large doses.

SALVARSAN AND NEO SALVARSAN: THEIR INTRAVENOUS INJECTION.

Ballenger and Elder (*Ann. Surg.*, November 1912) report their experiences of 860 administrations of "606" and the more recent "914." They have given 285 injections of "914" or neo salvarsan and believe it to be superior to "606" for the following reasons: It has only to be mixed with water and is then ready for the injection.

Very slight disturbance of the patient is produced by its injection intravenously—nausea, vomiting, chill, and fever being unusual complications. Repeated injections cause practically no reactions, and the treatments are not objected to by the patients. The mildness of the symptoms produced allows of the administration of full doses with more impunity than was the case with " 606 "; therefore with larger doses, repeated at shorter intervals, we may hope for more complete cures and few, if any, neuro-recurrences. The practical perfection of the drug as it is placed on the market will probably result in more uniformly satisfactory results from neo-salvarsan than resulted from salvarsan. Patients who have received both preparations have expressed a decided preference for neo-salvarsan.

The doses given to male adults were 0·75 to 0·9 grm. of neo-salvarsan, a quantity equal to 0·5 to 0·6 grm. of salvarsan, at the first injection, and the same dose or a larger one was given every two or three days until three or four injections were administered. A month was then allowed to elapse and the treatment repeated. Again at the end of the next month a single full dose should probably be given. If the Wassermann reaction remains negative, no further treatment will be required, and the writers have so far not required to supplement their treatment with mercury. The technique described by Ballenger and Elder consists essentially in making a minute puncture through the skin over a distended vein with a small pointed instrument, and plunging the injecting needle through this small puncture directly into the vein. They have made 695 consecutive intravenous injections without making an incision to expose the vein in a single case.

The Successful Treatment of Angiosclerotic Disturbances of Nutrition by Arteriovenous Anastomosis.

Wieting (*Deut. Zeitschr. f. Chir.*, Bd. cxix., Hefte 5 and 6), who introduced the operation of arterio-venous anastomosis for angiosclerotic gangrene or impending gangrene, discusses the successful results and failures which have followed his operation, and summarises the present position of the question as follows :—

(1) Arterio-venous anastomosis is at present the only means we can employ in the conservative treatment of angiosclerotic gangrene and allied conditions. (2) Arterio-venous anastomosis may be used to avoid a threatened gangrene or, in a case where gangrene has already occurred, to allow amputation to be performed nearer the gangrenous part than would otherwise be possible. (3) The method is only likely to succeed when certain definite indications are present, and these are, shortly : too much time must not be spent in trying any other conservative measures ; the patient must be in moderately good condition, not too old, and must not be suffering from a severe general infection : that is to say, his

vascular system must still be capable of a certain amount of accommodation to altered conditions; the local circulatory disturbance must be such that a free venous circulation can be reckoned on; the gangrene must not be very extensive nor spreading very rapidly, and, above all, must not be markedly infected, with the accompanying risk of an ascending thrombophlebitis or severe suppuration in the stump; extensive and progressive angiospastic symptoms modify the prognosis unfavourably, but are not a definite contra-indication; the femoral artery must pulsate well if the popliteal is occluded, and the femoral vein must of course be free; each case must be decided on its merits. (4) The method of choice is a lateral anastomosis between the vessels after cutting out an oval piece from the wall of each, a central ligature of the vein being carried out at the same time. (5) When gangrene is already present the gangrenous portion should be removed at the same sitting without the employment of any complicated flap or plastic method. (6) The arteriovenous anastomosis has no effect on the angiosclerotic process as such, so that recurrence of gangrene as the process advances is a possibility to be reckoned with. (7) The operation, when carried out under the indications given above, has not a high mortality; in fact if the cases are properly chosen it is almost nil. (8) The questions as to the feasibility of the operation can never be settled by experiments on animals; at the most these can only be used to explain the beneficial results. The decision as to the indications for its performance can only be made from clinical observations. Seeing that a number of undoubted successes have been obtained, it must be admitted that the performance of the operation is amply justified.

Burns and their Treatment.

Lieber (*Beitr. z. klin. Chir.*, Bd. lxxxi.—*Festschrift f. V. von Hacker*) discusses the problems associated with the treatment of burns and analyses the results of a series of 188 cases treated during the last 10 years in Lotheissen's clinique in Vienna.

He favours the view that death after a burn, except in cases dying in a few hours from shock, is due in the majority of cases to a toxaemia. The post-mortem appearances show changes in the kidneys, liver, and heart which are known to be produced by toxaemia in other conditions, and the view that a toxin is produced either in the skin of the burned area or in the body or blood as the result of some alteration in metabolism is the only one which satisfactorily explains the conditions found.

Of the 188 cases treated, 68 were in men, with 4 deaths, 50 in women, with 10 deaths, and 70 in children, with 24 deaths. As regards the relative number of deaths in children and adults and their relation to the extent of surface burned, Lieber calls attention to the fact that the child has, relatively to its weight, a larger skin surface than the adult, so that while a burn involving about one third of the surface

area in an adult is probably fatal, one involving about a ninth of the surface area in a child is likely to have equally serious effects. He divides the clinical course of burns into 3 periods—that of shock, that of toxæmia, and that of secondary infection. The great majority of deaths occur within the period of toxæmia, *i.e.* the first six days. Owing to the great variations in the severity of the cases treated in different periods, an accurate comparison of the results attained year by year is not possible, but during the last 2 years of the 10 years investigated, cases have been saved which in former years, under other plans of treatment, would probably have died, and Lieber lays stress on the fact that treatment directed against the toxæmia present is likely to be most successful. Bearing this in mind, the treatment now carried out in Lotheissen's clinique is as follows:—The administration of an anæsthetic or morphia is avoided. No formal attempt is made to render the skin aseptic, this being impossible without an anæsthetic and an increase of the shock already present. Gentle swabbing with benzine is allowed, followed by the application of a dry, mildly antiseptic dressing in the form of novoiodine powder covered with sterile gauze. Where pain is great anæsthesin powder may be spread first on the surface. This dressing is repeated in two days if necessary the old dressing being removed in a bath. Before the dressing is applied blisters are snipped at the base and charred pieces of skin are cut off. The general treatment consists in the free use of cardiac stimulants and, most important of all, the frequent administration of physiological salt solution subcutaneously, as much as 7 pints being given to an adult in 24 hours. The saline is said to counteract shock and to promote the elimination of toxic material by the kidneys. Moist dressings, greasy dressings, and sedatives are carefully avoided as tending to aggravate local infection and depress the patient's resistance. Since the line of treatment indicated has been followed, the general results are said to have been much improved.

Treatment with Novoiodine Paste.

The beneficial results following the injection of chronic sinuses and fistulæ with bismuth paste, as introduced by Beck of Chicago, are now well known, and the method is widely used. Unfortunately it is not quite free from danger, as bismuth poisoning occasionally follows its use. Lotheissen (*Beitr. z. klin. Chir.*, Bd. lxxxi.), in order to avoid the risk of poisoning, has for some time used a paste in which novoiodine is the active ingredient. This is a powder made by mixing hexamethylentetramindiiodide with talc. The powder is non-toxic, unirritating, and mildly antiseptic, and, like bismuth, throws a good shadow in radiographs, so that when injected as a soft paste it can be used to demonstrate the track of a complicated sinus. A suitable paste is made by mixing 60 parts of novoiodine with 120 parts of melted vaseline

and rubbing the powder well up with the vaseline. A slightly weaker paste may be made by adding 30 parts of liquid paraffin and 10 per cent. white wax. The results following the injection are equal to those when bismuth is used, and there is no fear of poisoning when injections are large   J. W. S.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

H. G. MELVILLE DUNLOP, M.D., AND A. DINGWALL FORDYCE, M.D.

CONGENITAL SYPHILIS.

WITH the introduction of the Wassermann test and of salvarsan into practical medicine an impetus has been given towards the solution of many points in the diagnosis and treatment of cases of syphilis and parasyphilis. The relationship between parental syphilis and mental deficiency in the offspring remains still a much disputed point. In the causation of idiocy the majority of authorities have held that parental syphilis played an unimportant part. Thus Sir Jonathan Hutchinson found an idiotic condition in only three out of 170 cases of congenital syphilis, and among the idiots at Earlswood Asylum did not find the specific characteristics of the teeth in any considerable number of cases.

Judson Bury and Shuttleworth, however, concluded that there was a closer relationship between congenital syphilis and mental deficiency than could be determined by institutional statistics. "It appears to be quite certain that only a small proportion of idiots show the classical signs and symptoms of congenital syphilis, and if we are restricted to the usual methods of examination we must come to the conclusion that congenital syphilis has little connection with idiocy." But the introduction of the Wassermann test afforded further opportunities of collecting evidence. With regard to this test the two following important facts have been established: "(1) A positive Wassermann reaction (if certain diseases, rare in this country, can be excluded) may be accepted as specific evidence of syphilis. (2) A positive reaction may be obtained with the serum of an individual who shows no other evidence of syphilis."

Dean (*Brit. Journ. Child. Dis.*, September 1912) reports the result of examination of 330 of the inmates of the Wilhelmstift, an asylum for idiots at Potsdam. A positive reaction to the Wassermann test was obtained in 51 cases (15·4 per cent.), while of the 330 patients there were only 9, or, including doubtful cases, 13, which from physical signs and symptoms would have justified the diagnosis of syphilis. A grouping of the 330 cases according to age gave the following result :—

	Examined.	Positive.	Percentage of Positive Results.
(1) Patients aged 10 years and under (of these two only were less than 5 years old)	94	20	21·27
(2) Patients from 11 up to 15 years of age inclusive .	142	24	16·9
(3) Patients from 16 to 20 years of age . . .	66	4	6·06

It would appear therefore that a larger percentage of positive results might be expected from the examination of a series of very young cases. Dean continues: "It seems to me reasonable to think that many cases of idiocy should be classed with that form of syphilis which manifests itself alone by a selective toxic action on the elements of the central nervous system. I do not wish to attach an exaggerated importance to the results of the examination of the serum in one series of cases, but when it can be shown that a considerable percentage of idiots afford evidence of a syphilitic infection, and since it is well known that the virus of syphilis is capable of exercising a selective action on the central nervous system in cases in which there is no other evidence of the disease, I think it is not unreasonable to infer a causal relation between the two conditions." The majority of idiots who give a positive Wassermann reaction show no other sign of syphilis; they are cases of latent syphilis, and it must be borne in mind that during the latent stages of the acquired disease only some 40 to 50 per cent. of the patients give a positive reaction. "I am therefore inclined to think that the actual percentage of positive results obtained by examining a series of idiots by the serum test comes very far short of the number which are actually infected. If this assumption is correct, we shall have to recognise syphilis as the causative factor in a very considerable percentage of cases of idiocy."

It is obviously desirable that the treatment of congenital syphilis should be commenced at the earliest possible moment, and if it can be established that congenital syphilis is a frequent cause of idiocy, it is reasonable to hope that very great success will follow the application of therapeutic and prophylactic measures. "We now possess in the Wassermann reaction a means of diagnosis which enables us to detect syphilis in cases in which it cannot be recognised by any other method. Wassermann has suggested that the serum test should be applied to every woman who is admitted to a lying-in hospital. When we consider the numerous cases in which syphilis is quite unsuspected, we must admit the value of his suggestion. If a positive reaction was obtained, treatment of the mother would be commenced at once, and treatment of the child might begin from the earliest possible time after

its birth. It can hardly be doubted that benefit would follow from the wholesale adoption of such measures."

With regard to methods of treatment it is of interest to note the success met with in the employment of "606" in the treatment of congenital syphilis. Fabre and Bourret (*Lyon méd.*, 3rd November 1912) treated the condition by injection of the pregnant mother and by injection of the newly-born infant. As a result of their experience they consider that the intravenous injection of salvarsan into a pregnant woman who is syphilitic but shows no active signs of the disease is very rarely indicated as a prophylactic measure on behalf of the fœtus. In such cases the classical treatment by mercury and iodides is satisfactory, and is certainly accompanied by less risk than the intravenous injection of salvarsan. It is only in exceptional instances that salvarsan is indicated in such cases—when, for example, mercury has proved unavailing in a previous pregnancy, or when there is serious difficulty in carrying out the prolonged treatment. In these cases they use relatively small doses of salvarsan and repeat the injection every three months during the pregnancy.

In those cases where the mother contracts syphilis after she has become pregnant they consider it reasonable to hope to be able to counteract the maternal infection before the fœtus is seriously affected. In order to do so it is necessary to act quickly, and in such cases there is definite indication for the injection of salvarsan. The appearance of secondary symptoms in a pregnant woman, showing that the syphilitic infection is of comparatively recent date, is equally an indication for energetic and rapid treatment and consequently for salvarsan. The chief indication for the use of salvarsan in the case of the infant is undoubtedly pemphigus. No other remedy is capable of curing the lesions so quickly or of averting what in most cases is impending death. The ordinary and slighter symptoms of congenital syphilis can be equally well treated by mercury and iodides, but salvarsan is much more rapid in its action. The value of salvarsan in improving the general condition is uncertain, and consequently in the case of a child affected by congenital syphilis who shows no active symptoms, but whose general condition is unsatisfactory, it is advisable to commence treatment with mercury and iodide, and only have recourse to salvarsan if these fail. In all cases it is essential to remember that injection of salvarsan should be followed by treatment with mercury and iodide, or more rarely in the child by successive injections, as its action is only temporary.

La Fetra (*Arch. of Ped.*, September 1912) found as the result of the injection of salvarsan that there was seldom any rise of temperature. He gave the drug intravenously thus:—

"The ages, the weight of the patients, and the dosage employed were as follows:—

Case 1. 2 mos.   Weight,   9 lbs., or about 4½ kg.   Dose, 0·05 grm.
  „   2. 9 mos.   „   7-8 lbs.   „   3¾ kg.   „   0·05 grm.
  „   3. 3 yrs.   „   25 lbs.   „   12 kg.   „   0·10 grm.
  „   4. 2 yrs.   „   23 lbs.   „   11½ kg.   „   0·10 grm.
  „   5. 2 yrs.   „   23 lbs.   „   11½ kg.   „   0·08 grm.
  „   6. 3 mos.   „   9 lbs.   „   4½ kg.   „   0·05 grm.
              on 12th October ; and second dose 18th December, 0·05 grm.
  „   7. 5½ yrs.   Weight, 27 lbs., or about 13 kg.   Dose, 0·10 grm.
              on 22nd October ; second dose, 7th January 1912, 0·10 grm.
  „   8. 17 mos.   Weight, 17 lbs., or about 8 kg.   Dose, 0 10 grm.
  „   9. 2 mos.   „   8 lbs.   „   4 kg.   „   0·10 grm.
  „ 10. 11 mos.   „   9 lbs.   „   4½ kg.   „   0·10 grm.

These last two doses were nearly double the proportions used before."

As the result of his experience he concludes : "(1) While the indirect method of giving salvarsan to the nursing mother is valuable, and should be used when the mother is available, the surest method consists in giving the salvarsan to the infant. Both indirect and direct administration should be employed whenever possible. (2) The intravenous route of administration is the best. Usually it will be found easiest to expose the vein before attempting to insert the needle. (3) The dosage should be not less than 0·01 grm. per kilogram of body weight. (4) Repeated injections and supplemental treatment by mercurials may be necessary. (5) The Wassermann reaction should be followed for a year."

The Prevention of Deafness in Children.

In a paper on this subject Yearsley (*Brit. Journ. Child. Dis.*, September 1912) states that as a result of the examination of the statistics of the London County Council Deaf Schools, the Royal School for Deaf and Dumb Children at Margate, and the Fitzroy Square School, he finds 845 cases of acquired deafness of which the causes were definitely ascertainable. Of these 723, or 85·2 per cent., came under the heading of infective diseases, meningitis, or primary ear disease, the numbers and percentages being :—

Infective diseases	.	.	.	.	343	or	47·4 per cent.
Meningitis	.	.	.	.	169	„	23·5 „
Primary ear disease	.	.	.	211	„	29·1 „
					723		100·0

As methods of prevention he suggests—(1) Better care of ears both during health and in disease. (2) The conscientious treatment of adenoids. "Not only must they be removed with care and thoroughness, but the catarrhal troubles which they leave behind must also be treated. It is not enough to remove these growths and expect everything to go well, but after-treatment must be followed out to relieve

any pharyngitis or rhinitis that remains. Everything must be done to ensure a free and healthy air-way through the nose, which alone is adapted to the physiological preparation of the air in respiration.

"*Prevention of Adenoids.*—But again we must go further: we must do our best to prevent the occurrence of adenoids by proper hygiene of the upper air-passages, fresh air, proper education in the use of the pocket-handkerchief, and the avoidance of conditions likely to lead to the formation of the growths. Most people now know something of the importance of respiratory exercises in the development of nasal breathing, but few realise how important these exercises are in infant life.

"Recently Barraud, of Lausanne, has pointed out that a great majority of adenoid cases occurs amongst the artificially fed, and a minimum in countries where normal maternal feeding is most common. This furnishes one reason more—and a very strong one —for advising all mothers to do their maternal duty and become complete mothers whenever it lies in their power to do so. However well artificial feeding be carried out it can never be considered as other than a makeshift. It has often been asked why adenoids appear to be more common than formerly, and why they are more often found amongst town dwellers and in manufacturing countries than in agricultural districts, and in Anglo-Saxon countries than in Spain and Italy. You have just heard the answer." A. D. F.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., AND R. CRANSTON LOW, M.B.

DISSEMINATE FUNGATING DERMATOMYCOSIS DUE TO THE MYCODERMA PULMONEUM.

THE diseases ascribable to parasitic agency increase in frequency, and new organisms are constantly being discovered. Some of these have been previously discovered as occurring in the expectoration from cases of chronic bronchitis, in that from tuberculous subjects, or even as simple saprophytes. Balzer, Gougerot, and Burnier (*Ann. de dermat. et de syph.*, August-September 1912, Paris) now direct attention to the mycoderma pulmoneum, which they have cultivated from a fungating and verrucose dermatitis, appearing in discrete patches. The interest to Edinburgh men consists in the fact that this particular microbe was found by Hughes Bennett and described in the *Transactions of the Royal Society of Edinburgh* in 1842. The case now related occurred in a man of 37, who was employed in carrying green vegetables in a basket supported by straps on his shoulders. He was otherwise healthy, and exhibited no signs of syphilis; the Wassermann reaction was negative, and there were no indications of pulmonary tuberculosis.

The eruption for which he asked advice presented a very special type. The localities affected were the face, trunk, especially the back where the basket pressed. and limbs.   The lesions began by the appearance of an acne-like pustule, which extended, became ulcerated, and crusted. The ulcers had irregular borders, a fungating base studded with numerous openings, from which welled out, on pressure, a viscous pus. The resulting cicatrix was smooth, indurated, of a violet-red hue.   The disease tended to recur at the margin of the scar as a verrucoma. The progress of the complaint was slow, occupying many months. Diagnosis is easy, for clinically it does not resemble any of the known types.   The parasite is found in the scrapings, and can be cultivated like the sporotrichoses on glycogelatine in the cold, giving in course of a few days characteristic colonies.   The mycodermata being widely diffused throughout Nature, it is necessary to identify this one carefully. Treatment by iodine and arsenic slowly influences the disease, but it is necessary to associate with these scraping, or the use of the thermo-cautery, as in blastomycoses.   Possibly early treatment of the commencing pustules by iodine. added to general measures, might check advance.

Circumscribed Precancerous Melanosis.

This is the subject which Dubreuilh (*Ann. de dermat. et de syph.*, March and April 1912. Paris) has set himself to elucidate.   Malignant tumours of epithelial origin are frequently preceded and ushered in by lesions benign in appearance, which may be termed precancerous. These lesions may remain stationary for an indefinite time.   They may even undergo spontaneous cure, but while they exist they are capable of originating a malignant new growth.   The seed of cancer is there, but dormant.   It may germinate tardily, or not at all.   These precancerous phenomena are more readily visible on the skin or on the epidermic mucosa than elsewhere.   Even in the case of rodent ulcer they may be there, though imperceptible.   Cutaneous cancer is a growth very different from the ordinary epitheliomata of the skin. It is again and again melanotic, and till quite recently has been regarded as a sarcoma.   Unna has demonstrated—(1) That the characteristic cells of the soft nævus are emigrant epithelial ones.   (2) That the malignant tumours consecutive to the degeneration of nævi have the same structure as the nævi. are thus of epithelial origin, and are not sarcomata but nævo-carcinomata.   While nævi form the principal, they are not the sole, starting-points of skin cancers.   Such may commence on a healthy surface or succeed an acquired melanotic lesion of variable duration.   In some cases, and particularly on the feet, the melanotic stain precedes by only a short period the carcinoma, of which it is the first manifestation.   In others the melanosis may last an indefinite time without taking on a malignant aspect, and during that time far from remaining immobile, as in a congenital pigmentary nævus, it may

enlarge or diminish, shift its ground, or even spontaneously disappear. The stain has been called the malignant freckle of the aged, but since it is not always either senile or malignant, the term adopted of circum-scribed precancerous melanosis is preferable. The process—evolution towards malignancy—is more active and more easy to follow than in the case of degenerating naevi. Dubreuilh has collected 32 cases, and finds the distribution between the sexes almost equal. While it may attack any part of the body it is most frequently met with on the face. The colour assumed by the stain is usually a sepia-brown, but it may be black. It is disposed in points or lines, which do not correspond to the folds of the skin or to the glandular orifices. The abnormal pig-mentation is the sole noticeable clinical alteration in the texture of the skin. As regards the pathological anatomy, the cutaneous changes are of two kinds, a metaplasia of the basal cells of the epidermis, and their pigmentation, this last being the least constant and the least important. Besides this there are seen between the epidermic cells and in the adjoining corium branched cells loaded with pigment. From the beginning of the change the uniting filaments between the cells and their own filamentous structure wholly disappear. Small groups of these altered cells can be seen, as also individual cells similarly attacked. At a later stage the corium shows an infiltration of leucocytes, which obscures the dermo-epidermic boundary, and is evident clinically by induration. Still cancerous tumours may appear on skin apparently healthy. Here it is possible that there may have been a non-melanotic precancerous stage which was not betrayed by any clinical symptom. The cell disturbance may be more extensive than could be inferred from the staining, and this has a bearing on treatment. The tumour consecutive to a patch of melanosis is not necessarily melanotic though often so. On the contrary, as Hutchinson has observed, the glandular generalisation is markedly so. The treatment *par excellence* of car-cinoma is by surgical extirpation. Should the patch of melanosis itself be wholly removed as a measure of prevention? From Dubreuilh's observations this is not likely to prove effectual. Pathological anatomy demonstrates that there may be threatening alterations apart from staining, and clinical evidence shows that tumours frequently appear wide of the melanotic area.

Röntgen Therapy in Acne.

Fisher (*New York Med. Journ.*, 13th July 1912) remarks that acne is sometimes such an obstinate and intractable disease to treat, and the patient is so frequently discouraged by the failure of the usual local applications and the systemic remedies to afford relief, that he is led to describe a series of twenty-one cases in which rontgenisation of the lesions was followed by almost uniformly good results. The procedure, though not new, is only rarely used in this disease. All were cases

which had been under treatment for acne for a long period of time, without permanent benefit. The method employed was as follows:—
The patient was placed in the recumbent position, the hair, eyelashes, and eyes—and if a man, the moustache—covered with lead foil. Each side of the face was treated separately, so as to obtain an equal distribution of the rays. A tube of low vacuum was used, held in a protective leaden glass shield eight to ten inches above the region over which the exposure was to be made. The rays, filtered through sole leather, allow the passage of three-fourths to one milliampère of current through the secondary circuit. This is about the radiance that in a darkened room will show as a faint yellowish-green light. Each side of the face received an exposure of from six to ten minutes, less if much inflammatory redness, more in pronounced induration. At first the exposures were twice a week, later once. There were occasional idiosyncrasies. Those who tan readily in the sun or are subject to sunburn are specially susceptible, and this liability should be inquired into before starting treatment. One of the first effects noted is the disappearance of co-existing oily seborrhœa. It is difficult to prognosticate how long it will take to cure a given case, for some of the milder examples yield less readily than the most severe. The results he has attained tend to support the view that acne is a local rather than a systemic disorder.

Some Improvements in the Treatment of Hypertrichosis.

While it is admitted that the only treatment for the removal of superfluous hairs, which has held its own, is electrolysis, yet this has certain drawbacks. The pain accompanying the procedure is one. Bann (*Journ. Amer. Med. Assoc.*, 13th July 1912) finds that by sopping on absolute alcohol from time to time while operating, the pain is much reduced. Besides this, the skin when dry is a bad conductor, and the alcohol dehydrates its surface. At the same time by macerating inspissated sebum and epithelial débris, blocking the orifice of the hair follicle, the entrance of the needle is facilitated. The needle he uses is rounded on the end, and preferably olive-pointed. The shaft being smaller than the bulb point has less area of contact and causes less electrolysis. The amount of current he prefers is from $\frac{1}{3}$ to 3 milliampères. This necessitates more time to accomplish the development of adequate alkalies to loosen the hair, but it is comparatively painless and the results are better. He first passes the needle without force till it reaches the bottom of the follicle, and continues the current till the follicle whitens, or bubbles serve to indicate the site of the hair follicle. The needle is then withdrawn. The hair is epilated, and the needle returned through the vacated follicle until it rests on the papilla. Enough electrolysis is then employed to destroy the papilla. There may be some difficulty experienced in re-introducing the needle exactly, but less lateral tissue is thereby sacrificed. Pumice stone, recently

lauded as a cure for hypertrichosis, while it rubs away the fine hairs eventually increases the growth.

Pellidol and Azodol for the Treatment of Eczema with Tendency to Exudation.

Bantlin (*Munch. med. Woch.*, 24th September 1912) remarks that moist eczema in children constitutes one of the most vexatious and obstinate of ailments. Observations on the efficacy of scarlet red in promoting epithelial regeneration have induced Kalle & Co., Biebrich, to introduce into notice a related substance, more soluble in fats and oils and less toxic. This they have called Pellidol. According to Hayward the active constituent of scarlet red is amidoazotoluol, while pellidol is diazethyl-o-amidoazotoluol. Azodol is a combination of pellidol with iodised albumen. A two to a four per cent. salve containing these seem, as far as observations at present go, equally efficacious. It was found that the injuries from burns rapidly healed under the use of this; also erythemata with marked shedding of epithelium quickly improved. Eczema in all stages—weeping, crusted, scaly, and dry—exhibited rapid retrogression of the symptoms. The oozing surfaces became dry, the crusts separated, the scaling diminished, while the troublesome itching daily abated. The mothers stated that the children, previously kept awake by the desire to scratch, now slept quietly as a result of the application of the ointment. The infiltration and induration of the corium, so constant a feature in long-standing eczema, lessened, and this perhaps explains the anti pruritic action of the pellidol ointment. Recent cases improved most speedily; in chronic examples there sometimes were small recurrences, but these yielded to fresh applications of pellidol ointment. Bantlin is of opinion that pellidol is efficacious in exudative eczema, and is suited for all stages, while it is relatively harmless.

Poisoning by Scarlet Red.

Lyle (*New York Med. Rec.*, 16th November 1912) observes that the clinical use of the dye scarlet red has amply fulfilled the promises of its early sponsors, and is to-day the best epithelial stimulant we possess. In rare instances scarlet red produces a local wound irritation, a discoloration of the urine, and possibly an albuminuria. He quotes an instance in a child of eleven years suffering from an extensive burn due to the explosion of turpentine, to which an 8 per cent. ointment of scarlet red was applied. He relates another of his own, also a burn, but from exploding benzine. The same strength of salve was employed. In the child's case the ointment was spread over a fresh wound, and the toxic symptoms developed within a few hours. In the second the ointment was used on a surface in process of granulation, and the toxic symptoms did not appear till the sixteenth day. Marked features in

both were dizziness, gastralgia, and intense nausea and vomiting with albuminuria. These disappeared when the use of the ointment was intermitted. Schmieden, commenting on the first case, says that scarlet red ought not to be used in fresh wounds, and in large granulating ones only a thin layer of the ointment should be painted on the edges.

W. A. J.

MEDICAL JURISPRUDENCE.

UNDER THE CHARGE OF
HARVEY LITTLEJOHN, M.D.

Ventricular Fibrillation as a Cause of Sudden Death.

In a number of cases of death from what would ordinarily be called "heart failure" there is, according to Professor H. E. Hering (*Münch. med. Woch.*, 1912), as the immediate cause, a condition of ventricular fibrillation. His observations bearing on this question are summed up as follows : (1) Experimentally, death can be brought about within a minute through ventricular fibrillation, respiration continuing for a little time after the heart has ceased to drive out any more blood. (2) The causes of ventricular fibrillation may be divided into predisposing and exciting. If the former are present the latter need only be trifling in nature. (3) The condition is present in human hearts which have been restarted to beat by artificial means. (4) It should be kept in mind as a likely ultimate cause of death in any case of unexpected death occurring really suddenly ("minute death"), particularly if it has been noticed that breathing continued after beating of the heart was clinically unobservable. (5) It must be noted, however, that respiration may outlast beating of the heart in other forms of death, and ventricular fibrillation should only be predicated if clinical evidence of other forms be lacking. (6) If the post-mortem affords no clear evidence of any other cause for the sudden death, this is in favour of its having been due to ventricular fibrillation. (7) Clinically, death through ventricular fibrillation is apt to occur in cases of cardiac disturbance of an erethistic or irritable nature, to which group belong cases with extra-systole, constant irregularity (auricular fibrillation), and tachycardia. (8) Experimentally it is also found that with such predisposing conditions ventricular fibrillation is liable to follow on extra-systole and tachycardia, and may be combined with auricular fibrillation. It has been brought on by intravenous injection of potassium salts, by ligature of a coronary artery whereby extra-systole and tachycardia finally end in fibrillation. Narcosis, especially with chloroform, may produce it, likewise asphyxia. It comes on most readily in a dilated heart. (9) Its occurrence can only be definitely made out by the electrocardiograph.

There is, lastly, a consideration of a case of quite sudden "thymustod" in a girl of twenty-one, who had valvular defects and a

constantly irregular pulse, and in whom the occurrence of ventricular fibrillation was suspected—a suspicion which the sectio did not contra-indicate. The author regards status lymphaticus as a strongly pre-disposing condition to ventricular fibrillation. The sudden deaths so apt to occur in the subjects of lymphatism when under chloroform are in all likelihood due to the onset of ventricular fibrillation.

Hæmin and Hæmochromogen Crystals as Tests for Blood.

From a large number of tests Heine (*Vrtljhrschr. f. gericht. Med. u. off. Sanitätswesen*, 1912, Bd. xliii. S. 268) comes to the conclusion that these tests are of practically equal value. He failed to get hæmo-chromogen crystals in two cases in which he got hæmin crystals, but in two others obtained hæmochromogen in which the latter could not be got or were so small as to be visible only with an oil-immersion lens. The presence of lime, *e.g.*, in the case of blood-stains on cement or mortar, especially if exposed to varying weather conditions, was found to be exceedingly inimical to obtaining either variety of crystals, and in the presence of rust hæmochromogen in particular could only be obtained if the blood was in considerable excess and the stain one of recent origin.

The hæmochromogen crystal test is a simple one, and should certainly not be omitted in any case where the Teichmann hæmin test proves negative. The reagent recommended is a mixture of two parts of pyridin (purissimum, Merck) with three parts concentrated watery solution of hydrazin sulphate. A drop of this is added on a slide to a little of the suspected material, well broken up, a cover-glass put on, and the preparation gently heated until bubbles are appearing. It is then laid down on some non-conductor and allowed to cool gradually. With fluid blood or solutions of blood previous drying is unnecessary, as the reagent may be added to the liquid and treated in the same manner. Careful searching for the crystals is important, and some-times the use of an oil immersion lens is necessary. They appear as fine needles, which may be straight or bent, and are sometimes split at the ends. They may occur singly, crossed, or arranged in clumps or rosette form. They are doubly refracting, not strongly refractile, copper-red in colour, with fairly marked pleochroism from red-brown to orange-red.

Effects of Post Mortem Mechanical Violence.

It has long been known that injuries produced by mechanical violence shortly before death are not accompanied by the signs of vital reaction, and that it is practically impossible to distinguish them from injuries produced within a short time after death. It is also recognised, although not so widely appreciated, that serous or hæmorrhagic effusions, or both, may occur in the neighbourhood of definitely post-

mortem injuries. Professor Lesser (*Vrtljhrschr. f. gericht. Med. u. öff. Sanitätswesen*, 1912, Bd. xliv. S. 203) records a number of his experimental observations which are sufficiently striking to merit attention and to make one extremely careful in deciding whether any given injury could or could not have been produced after death, especially in infants. There are other factors than the mechanical violence which play a part in determining whether or not any hæmorrhage, etc., will occur after a post-mortem injury, but despite his not inconsiderable number of experiments the distinguished author has not been able to determine what these are, and puts forward no theory to explain their occurrence in some instances and non-occurrence in others. At present he leaves the facts simply to speak for themselves. Most of the experiments were carried out on the bodies of young infants, a few on adults. In all, the effect of post-mortem decomposition as a factor in the production of the resulting appearances could be excluded. The following are some of the results noted: (1) *Head injuries.*—As the result of blows on the heads of infants at times varying from a quarter of an hour to three and a half days after death and kept for some time under varying circumstances he obtained in some instances hæmorrhages and œdema in the subaponeurotic tissues and subperiosteally, also in the subdural space and in the meshes of the pia-arachnoid, but never within the brain substance. The extra-cranial hæmorrhages exceeded the intra-cranial to a much greater extent than is usual in injuries produced during birth. He also records the occurrence of considerable hæmorrhages and œdema after similar injuries in adults, and in both instances the appearances were at times quite indistinguishable from the effects of agonal injuries or of blows which might in themselves have produced the fatal ending. (2) *Neck injuries.*—A dead-born child compressed about the neck, as in manual strangulation, an hour after birth showed hæmorrhages in the loose cellular tissues of the neck which could scarcely have been greater if death had been due to trangulation. The results of tying strings around the neck were, however, in all cases negative. Blows on the neck in ten cases of children and adults produced in three instances well-marked hæmorrhages, even at considerable depths. The most surprising result was the production of hæmorrhages in the mucous membrane and submucosa of the pharynx and an œdema along with the hæmorrhages, which could not have been greater in a fatal pharyngeal cellulitis. Somewhat similar injuries were found in the larynx, indistinguishable from what might have been produced *intra vitam*. (3) *Chest injuries.*—Out of thirteen cases of injuries to the chest-wall, such as by blows and kicks, a number showed subpleural hæmorrhages, in four there were more or less extensive hæmorrhages in the lungs, but in four others with similar injuries the lungs were unaffected. Several showed nothing even in the chest-wall. In two instances there was blood in the pericardium, once from a

minute rupture in the right auricle, and once from a tear 1 cm. long in the left ventricle. (4) *Abdominal injuries.*—As the result of a heavy blow with a hammer in the lumbar region twenty-one hours after death the body of an infant showed marked œdema about the lower ribs and kidney region, and there were 80 c.c. fluid blood in the peritoneal cavity, apparently coming from rupture of the umbilical veins in their intra-peritoneal course. There was also some retroperitoneal hæmorrhage. Another case from a blow over the liver eighteen hours after death showed rupture of the liver, with 50 c.c. fluid blood in the peritoneum. A third showed almost no free blood although the liver was ruptured. From blows on the anterior abdominal wall small quantities of fluid blood were occasionally found in the peritoneum and also hæmorrhages in the loose tissues about the organs. (5) *Injuries to the extremities.*—In several cases the femora were fractured, but only in one instance was there any other lesion produced, viz., a small hæmorrhage subcutaneously.

Liver Glycogen as a Test for the Rate of Death.

In 1899 the presence of glycogen in the liver post mortem was put forward by Lacassagne and Martin as a proof that death had occurred suddenly. Since then the validity of the test has been called in question by several writers, more especially by Meixner in 1909, who limited its value considerably. He would only admit that the test was of some value if the liver were found to contain glycogen in considerable amount or else none at all. In the former case death had *probably* occurred suddenly ; in the latter the agonal period had been longer drawn out. He also laid stress upon the position of the glycogen ; if it were intra-cellular the presumption of sudden death was much stronger, if it were outside the liver cells, in the spaces between the cells and the blood vessels, and in the capillaries themselves, then no such conclusion could be drawn. Sjövall (*Vrtljhrschr. f. gerichtl. Med. u. off. Sanitatswesen*, 1912, Bd. xliii. S. 28 and 289) flatly denies that the test is of any value whatsoever in determining whether death has occurred suddenly or not. Whilst admitting that if the agonal period is a drawn out one the glycogen content of the liver is greatly diminished, he shows pretty conclusively from post mortem examination of a variety of cases, and from a number of animal experiments, that this is merely one of a number of factors which may influence the disappearance of glycogen from the liver, and that in any particular case it is impossible from this to draw with any certainty conclusions as to the kind of death. With regard to the intra- or extra-cellular position of the glycogen, that, he considers, depends so much upon post mortem factors as also to be of no value in arriving at a diagnosis of whether death occurred suddenly or the reverse

J. H. H. P.

NEW BOOKS.

Collected Papers by the Staff of St. Mary's Hospital, Rochester, Minnesota. Pp. 603. Philadelphia: W. B. Saunders Co. 1912.

A Collection of Papers Published Previous to 1909. By WILLIAM J. MAYO and CHARLES H. MAYO. Two Vols. Philadelphia: W. B. Saunders Co. 1912.

THE most recent issue of the papers emanating from the Mayo Clinic at Rochester fully maintains the high standard set by its predecessors. This publication reflects all that is most advanced in present-day surgery, and it has now come to be an indispensable source of information alike for the teacher and investigator. The preponderance of contributions relating to the surgery of the abdomen, including the genito-urinary system, indicates the present general trend of surgical advance, and the wide range of subjects dealt with shows how far the surgeon has encroached upon domains hitherto claimed by the physician.

It is impossible in a short notice even to refer to the individual contributions, and where each is of the highest quality it would be invidious to select any for special mention. We cannot, however, leave this volume without paying our mead of respect to the memory of that really remarkable man William Morrell Mayo, the father of the two distinguished surgeons who have made the town of Rochester famous, who died full of years and respected and loved by all who came under his influence.

Mrs. M. H. Mellish, who edits with such conspicuous ability the work just noticed, has placed the surgical reader under a further debt of gratitude to her by publishing, in two volumes uniform with the "Collected Papers" series, the numerous contributions to surgical literature made by the Mayo brothers previous to 1909. We have thus in a convenient form for reference a record of all the important work done at Rochester by these surgeons. These volumes should be on the shelves of every medical library and of every operating surgeon.

The Treatment of Infantile Paralysis. By OSKAR VULPIUS, Professor Extraordinary at the University of Heidelberg. Translated by ALLAN H. TODD, M.B., B.S.(Lond.). London: Baillière, Tindall & Cox. 1912.

THIS important work, written by one of the first authorities on the subject, deals almost exclusively with the orthopædic treatment of the sequelæ of epidemic myelitis: a few introductory chapters have been added, however, dealing with the symptomatology, etiology, and pathological anatomy of the disease. The rest of the book is divided into two parts, of which the first deals with the therapeutic methods in use at the present time, the second comprising a description of

the paralyses of the various parts of the body and of their treatment. The introductory chapters, although limited in scope, give an excellent account of the disease. Authorities are quoted who maintain that the cerebral and spinal palsies of children are really one and the same affection, differing only in the anatomical structure which they chance to affect. The author makes the important comment that cerebral paralysis differs from spinal, not only in the treatment that is required, but also in the success which is obtained. He records interesting examples in which the leg affected by paralysis has actually undergone elongation; in the majority of cases, however, it would appear to be only an apparent lengthening. In discussing the bacteriology of acute poliomyelitis suitable reference is made to recent investigations, and particularly those by Flexner of New York. As already mentioned, the greater part of the work is taken up with the treatment. The various therapeutic measures employed in the prevention and correction of deformities are described in clear language, and the number of excellent illustrations makes it easy of comprehension by the reader. We venture to hope that this excellent and practical manual will receive the attention it deserves. The treatment of infantile paralysis in this country leaves a great deal to be desired.

A Treatise on Tumours. By ARTHUR E. HERTZLER, M.D., Associate Professor of Surgery in the University of Kansas. London: J. & A. Churchill. 1912. Price 30s. net.

THIS large and pretentious work is dedicated by the author to his wife, " who through many years has kept together the data that have gone to make up the book." The aim of the work is " to give students and practitioners a guide to the proper recognition of tumours ; available books dealing with this subject are either broadly clinical or entirely scientific. A proper comprehension of any tumour demands the application of both the scientific view-point and clinical observation. The aim has been to supply this need." After a conscientious perusal of the book we are unable to say that the author has entirely succeeded. He quotes the high authority of Virchow in grouping together all tumours both true and false, as " from the clinical point of view this is the only possible method of approaching a proper grasp of the subject ;" for example, with tumours of the cranium are included wens, dermoids, gummata, and hernia cerebri.

The well known and useful classification of Ribbert is closely followed, and a good description is given of the theories regarding the etiology of tumours.

Part I., which deals with the general pathology of tumours, is clearly and concisely written. No reference is made to the spread of cancer by permeation that is made so much of by Sampson Handley. We think the use of the term "expansile" as the reverse of "infiltrating"

unfortunate. It is stated, for example, that "osteomas are expansile and benign."

Part II., which deals with the special pathology of tumours, is on the whole a very readable and instructive account of this important subject. It may be said that the author shows a more intimate acquaintance with German literature than with French or English. The amount of attention given to different groups of tumours is unequal; endotheliomata, for example, are dealt with at considerable length, while osteomata, neuromata, and odontomata are very curtly dealt with. There is a chapter on multiple myelomata, but no mention of the solitary variety except under giant-celled sarcoma.

Part III. deals with tumours of the different regions and organs. There is here again a want of uniformity in scope which is often difficult to explain, as when, for example, a whole page is devoted to secondary cancer of the liver and only a few lines to retroperitoneal growths. Epithelial tumours of the jaws, except those which arise from teeth germs, are not even mentioned. The sections on the mamma and on the stomach are, on the other hand, all that could be desired.

We have ventured to criticise this work somewhat closely, but not in any captious sense. It is undoubtedly an educational work of great value, and the illustrations, which are both very numerous (538) and of a very high standard of excellence, convey a great deal of useful information.

Primary Malignant Growths of the Lungs and Bronchi: A pathological and Clinical Study. By I. ADLER, A.M., M.D. Pp. 235. London: Longmans, Green & Co. 1912. Price 16s.

IN this volume Dr. Adler presents the results of his own experience and of a very thorough and critically conducted investigation of cases recorded by others. He distrusts existing statistics. After an introduction, mainly statistical, the author proceeds to discuss "pre-cancerous influences" and "etiology." "Pathology" occupies three chapters. Little of a novel nature is disclosed regarding the characters of pulmonary carcinoma and sarcoma, but attention is rightly drawn to the necessity for examining several portions of the tumours in view of the frequently polymorphic characters of the cells. The most interesting discussion is that on the true nature, derivation, and relations of endothelium. The following quotations indicate the author's standpoint. "Opinion is gaining ground that the intimate structure of a tumour is not dependent upon certain phases of embryological development, nor upon the morphological relations of the three germinal layers." "Extra-uterine pathology should not be tyrannised over by embryology." He is disposed to class individual endotheliomata either with the carcinomata or with the sarcomata, if the structure corresponds.

The available clinical diagnostic signs are considered under the headings—Pain, Cough, Sputum, Respiratory Difficulties, Cachexia, Fever, Blood Counts, and others of less importance. The employment of X-rays and bronchoscopy is discussed favourably at considerable length, and attention is directed to the differential diagnosis from aneurysm and tuberculosis. The clinical chapters are in some respects more satisfactory than those on the pathology of the condition. Dr. Adler has collected 581 cases of malignant tumour of the lungs from the literature, and the details of these occupy two-thirds of the volume. He divides them into carcinoma (374 cases), sarcoma (90 cases), of doubtful nature (99 cases), and miscellaneous (18 cases). This highly readable though critical treatise should prove of great value to all interested in the diagnosis and nature of malignant tumours of the mediastinum, lungs, and pleuræ.

The Clinical Pathology of Syphilis and Parasyphilis, and its Value for Diagnosis and Controlling Treatment. By HUGH WANSEY BAYLY, M.A., M.R.C.S., L.R.C.P. Pp. 194. With 25 Illustrations. London: Baillière, Tindall & Cox. 1912. Price 5s. net.

THE aim of this book is to give a short and practical account of the clinical pathology and treatment of syphilis and parasyphilis. This is done in a clear, lucid, and scientific manner. The chapters on parasitology are excellent. Several chapters are devoted to a description of the nature and technique of the Wassermann reaction. We regret to see that the author in the chapter on the administration of salvarsan advises allowing the blood to flow past the "special window" in the tube to determine if the needle is in the vein—a dangerous practice, besides being quite unnecessary. We can commend to the attention of students and practitioners this book as one in which they will find much practical assistance and information.

Digestion and Metabolism. The Physiological and Pathological Chemistry of Nutrition. By ALONZO ENGLEBERT TAYLOR, M.D. Pp. 560. London: J. & A. Churchill. 1912. Price 18s. net.

IN his preface the author, who is Rush Professor of Physiological Chemistry in the University of Pennsylvania, states that the book aims at describing "in a popular manner, without technical details and from the standpoint of dynamics rather than from that of analytical statics," the processes involved in normal and abnormal digestion and metabolism. The result is an altogether helpful and instructive volume, although it is open to question whether even American practitioners are so universally conversant with the methods of the differential and integral calculus as to justify the introduction of even elementary portions of that department of mathematics into the discussion of the processes of catalytic

action of ferments. Apart, however, from the chapter on the theory of ferment action the book is quite within the capacity of the average student, and even in the chapter referred to the results of the investigation are clearly set forth, although some readers may stumble over the proof.

The book consists of ten chapters dealing with the composition of food-stuffs, the theory of ferment action, digestion, carbohydrate fat and protein metabolism, creatin-creatinin and purin metabolism, auto-intoxication, metabolism as a whole, thermogenesis and thermotaxis. Of most interest to the physician are probably the chapter on carbo-hydrate metabolism, containing as it does a thoughtful and stimulating section on diabetes mellitus, and that on purin metabolism and its relation to gout.

Free use is made throughout the book of graphic formulæ, which, although they occupy considerable space, are distinctly helpful to those who are not habitually working at organic chemistry, and diagrammatic schemes are introduced where they may be found useful in tracing the course of the more complicated metabolic processes.

The book can be recommended to all who desire to obtain a working knowledge of the chemical processes which occur in the body in health and in disease.

Hypnotism and Disease. A Plea for Rational Psychotherapy. By HUGH CRICHTON MILLER, M.A., M.D.(Edin. and Pavia). With an Introduction by CHARLES LLOYD LUCKEY, M.D. Pp. 252. London: T. Fisher Unwin. 1912. Price 5s. net.

THIS volume is intended to put the facts of "psychotherapy" before "the intelligent lay reader of either sex," as well as such medical practitioners as "are anxious to attain a general understanding of the subject." The result of the compromise is a somewhat desultory, if freshly-written, treatise. With all due respect to the writer we do not think that there is yet sufficient agreement as to the basis and boundaries of this subject to allow of its being either classed as a "science" or included in the curriculum of the medical student. Better, indeed, than the propagation of a new specialism would be a more honest appreciation on the part of the ordinary medical practitioner of the *rôle* played by mental and moral factors in health and disease. When our author essays to draw a hard-and-fast line between the methods of the quack and the "strictly ethical" administration of placebos by the qualified physician, he is ingenious, but hardly convincing. Let us put away cant in this matter. The truth, of course, is that in practice a spice of charlatanry or deception (call it what we will) is practically inevitable where we have to deal with patients of low mental grade; in this respect the difference between the honest physician and the quack is purely one of degree. Dr. Miller says many wise things in this book—we are entirely at one with him, for instance, in his strictures

on the indiscriminate use of the rest-cure—but we do most emphatically disagree that "for all the phobiæ, without exception, hypnotic suggestion is the indicated and only treatment." A statement like that is utterly in disaccord with the spirit of another pronouncement of the writer's—which we take to be one of the wisest things said in the book—that passage, namely, where he lays stress on "common sense" as one of the most necessary qualities of the would-be psychotherapist, and concludes that "if he can add the saving grace of humour to his other attributes it will prevent his taking himself or his patient too seriously." This book is worth reading.

English Echoes from the Quartier Latin. Poems by K. W. LUNDIE. London : Elkin Mathews. 1912. Price 1s. 6d. net.

THE *imprimatur* of Mr. Elkin Mathews on the title-page of a book of verse is no doubtful guide to the literary quality of the work, nor does this slender volume betray our hopes. Its authoress, who is, we may perhaps mention, the daughter of a well-known Edinburgh physician, has produced some two score lyrics of neat and often well-finished workmanship, in varying styles and varying moods. Not a few of the poems—as the title of the collection might suggest—receive their inspiration from Parisian life, and in these, and in those inspired by the joy of youth and springtide, Miss Lundie shows her talent to the best advantage. Varied are the topics her graceful pen touches upon—Parisian flats, Goethe, aeroplaning, pathological research, health, China, and even the Balkan war, to mention but a few : but in all we can find a delightful freshness, in several a pleasant sense of humour, and in a few very considerable originality of thought. We can recommend this inexpensive little book as the work of a lady undoubtedly gifted in no mean measure with true poetical ability.

NEW EDITIONS.

Obstetrics. By J. WHITRIDGE WILLIAMS, M.D. Third Edition. London : D. Appleton & Co. Price 25s.

IN the third edition of this well known work on obstetrics Professor Williams has revised the previous edition on so many different points as to make it almost a new book. By judicious elimination he has not enlarged the volume to any great extent, so that it is not cumbersome, and remains a standard text-book for advanced students and the general practitioner.

Numerous changes have been made in the chapter on the development of the ovum, which embodies the latest teaching derived from the early ova described by Bryce and Teacher and others.

In the chapter on the toxæmias of pregnancy the author draws

largely on his own great experience, and so speaks with undoubted authority. In hyperemesis gravidarum he relies mainly on the ammonia coefficient of the urine for diagnosis as to which variety is present, and believes in prompt induction of abortion as soon as the diagnosis of toxæmic vomiting is made. The different methods of performing Cæsarean section are fully dealt with and compared; the judgment of the author is in favour of the conservative operation. The other methods of treating contracted pelvis receive due attention, especially pubiotomy, which Dr. Williams considers to be rarely an alternative to Cæsarean section, but usually to be performed when Cæsarean section is not the operation of election. In the author's experience it has yielded brilliant results, both immediate and remote, but he does not minimise its dangers in the hands of even the most experienced operators.

It is interesting to note that he does not agree with the modern treatment of early rising in the puerperium, and believes in keeping his patients in bed till the tenth day at earliest.

This edition is even more profusely illustrated than its predecessors, and at the end of each chapter is given a full list of the references, an invaluable aid to anyone wishing to consult the original articles which have been quoted. Though written for both students and practitioners, it is too large to be a popular text-book with the former, but it is, from its theoretical knowledge and its practical information, an ideal book for the general practitioner to consult.

Mind and its Disorders. By W. H. B. STODDART, M.D. Second Edition. Pp. 518. London: H. K. Lewis. 1912. Price 12s. 6d. net.

SINCE the first edition of this book was published in 1908 there have been many additions to our knowledge of psychiatry, and a perusal of this edition shows that Dr. Stoddart has brought his work well up to date. In the first section there is little change excepting for a few additions on the subconscious state, which paves the way for two new and interesting chapters in the second section, where the author deals shortly with the psycho-pathological and sexual theories advanced by Freud and Jung. Recent German and American authorities attach much importance to subconsciousness and its investigation by means of psycho-analysis, but the author considers that the value of this form of examination is at present overestimated. The third section has with advatnage undergone considerable rearrangement in order to establish more clearly the similarity of the various toxic psychoses. The sections on treatment are sound, but we noticed the omission of several points which we have come to consider essential in the conduct of cases. We can confidently recommend this edition as a valuable help to practitioners and students in the study of psychiatry.

NOTES ON BOOKS.

WE recently had the pleasure of highly recommending Professor H. P. Pickerill's book upon the *Prevention of Dental Caries*, and this only accentuates the feeling of disappointment which remains after reading his *Stomatology in General Practice* (Henry Frowde, and Hodder & Stoughton, 1912, 15s. net). Judging the book from the standpoint of the general medical practitioner, there is much that is of interest to him and of value to his patients, especially where the prevention of disease is dealt with ; but there is a great deal of information that is of no real interest to either, or that is too scrappy to be of any real use. Throughout the book there is evidence of the lack of ripe experience and consequently of sound judgment, which should be the foundation on which a book dealing with the border lines of dental surgery on the one hand, and of general medicine and surgery on the other, should be based. For instance, the author does not convey a clear idea of either the construction or mode of action of an obturator. Taking another practical subject, the chapter dealing with anaesthesia is misleading and reactionary, one of the many evidences of which is the author's belief in the safety of chloroform when administered with a Junker's apparatus, and his preference for cocaine over other analgesics. We feel sure that in course of time Professor Pickerill will greatly modify both the scope and substance of his lectures to medical students, and if so, a subsequent edition of the book should be of much greater value to the general practitioner, for whom it is intended.

La Tuberculose Inflammatoire, by Poncet et Leriche of the University of Lyons (Paris, Doin et fils, 1912). *Le Rheumatisme Tuberculeux*, by the same authors, which appeared three years ago, created a good deal of interest ; the view was advocated that all forms of chronic joint disease, and especially those included under the term arthritis deformans, were the result of an attenuated tuberculous infection. While the doctrine may be said to have received a good deal of support from the point of view of etiology, considerable disappointment was experienced in the results of treating such chronic joint affections on the view that they are of tuberculous origin. The authors now extend the doctrine to the other tissues and organs of the body, and they are sanguine enough to ascribe to an attenuated tuberculous infection practically every morbid process of which the etiology has not been definitely established. Like most pioneers they probably have exceeded their limitations. Their work, however, is interesting and suggestive, and can be cordially recommended.

In his *Treatise on Treatment* (Calcutta, 1911) Dr. Jogender Lal Chundra presents his readers with a painstaking digest of the subject. He has laid the chief English, French, and German authorities under contribution, and has arranged his material in an orderly manner. We

do not doubt that the book will be found useful by Indian medical men, for whom it is especially intended, and we have great pleasure in recommending the book as a trustworthy guide to its subject.

A Text-Book of Practical Therapeutics, by H. A. Hare, M.D., B.Sc. (Henry Kimpton), has now reached its fourteenth edition. The present volume has been largely rewritten, and text dealing with the use of salvarsan, tuberculin, and vaccine therapy introduced. The recent advances in the diagnosis of cardiac diseases have also been attended to and the new lines of treatment emphasised. In its general outlines the book remains as before. The illustrations consist of 131 engravings and 8 plates.

Aids to Tropical Hygiene, by Major R. J. Blackham, D.Ph., R.A.M.C., forms the latest volume of the Students' Aid Series (Baillière, Tindall & Cox). The subject, though highly important, has not previously been treated as a separate entity, but has only formed a part of works on tropical medicine. Fortunately the author has kept out technicalities as far as possible, and has written a book that can be read and understood even by non-medical colonists, while doctors will find much of interest and instruction in the chapters on meteorology, food, clothing, and the prevention of malaria. A concise account is also given of the relation of insects to disease, and of the animal parasites.

Electrical Injuries: Their Causation, Treatment, and Prevention, by Charles A. Lauffer, A.M., M.D. (John Wiley & Sons), supplies in small compass a useful guide to electrical workers. The increasing frequency of industrial mishaps from exposure to flashes or actual contact has necessitated the provision of instruction to employees in first aid, and in the avoidance of dangers incidental to their employment. The work under review presents such instruction in a form that has been found successful in practice, and constitutes a useful guide alike for doctors and electricians.

In *Medico-Legal Examinations and the Workmen's Compensation Act*, 1906 (Ballière, Tindall & Cox, 1912, price 5s.), Sir John Collie has recorded the results of his extensive experience in the examination of injured workmen, and he throws many valuable sidelights on the way in which this Act is abused. With his suggestion for providing a means by which certain workmen should be allowed to contract out of the Act, we are in cordial agreement, alike in the interest of the workman and employer. The other proposals he makes for amendment of the Act are moderate, fair, and practicable.

Laboratory Methods, by B. G. R. Williams, M.D., and E. G. C. Williams, M.D. (Henry Kimpton, 1912, price 10s.). This book is written on new lines, and is adapted specially for the general practitioner. Elaborate apparatus and highly specialised technique are tabooed, and many ingenious substitutes for both are described.

Perhaps its chief claim to approbation consists in the fact that it covers a wide range of subjects. Not only are the ordinary bacteriological and hæmatological examinations succinctly described, but the detection of common poisons, some simple water analyses, and a useful account of milk and its home modifications are included. The book is well got up, and the illustrations are clear and well chosen.

Statistics of Puerperal Fever and Allied Infectious Diseases, by George Geddes, M.D. (John Wright & Sons, Ltd., 1912, price 6s. net). In this thesis the author presents a truly appalling array of statistics and graphic curves, the object of which is to show, among other points, that puerperal infection is more common in industrial areas in which accidents, and therefore sepsis, are more frequent. Although this conclusion is not an original one, the author is be congratulated on the enormous amount of labour which he has undertaken in demonstrating his points. The book is an earnest plea for greater care in regard to surgical cleanliness on the part of the medical attendant, but it is to be feared that the brain-shattering display of figures will prevent it being read except by those who have been educated to Blue Books.

To the general practitioner the second edition of *Consumption in General Practice*, by H. Hyslop Thomson, M.D. (Frowde, Hodder & Stoughton, 1912, price 12s. 6d. net), will prove an extremely useful and interesting volume. Diagnosis and prognosis are discussed before the cause of the disease, but there is an evident advantage in so doing, as by this arrangement cause is brought into immediate relation with methods of prevention and treatment. The closing chapter on the construction of sanatoria should be specially useful at present, seeing that many sanatoria will be required under the Insurance Act.

Dr. W. D'Este Emery's *Clinical Bacteriology and Hæmatology for Practitioners* (fourth edition, H. K. Lewis, price 7s. 6d. net) will prove invaluable to senior students, to graduates who are working at clinical pathology, and to those commencing laboratory work along these lines. The general practitioner who has time to do his own hæmatological and bacteriological work will find all the information he requires in this excellent book.

It is not necessary for us to do more than chronicle the appearance of the seventh edition of Dr. Kurre W. Ostrom's *Massage and Swedish Movements* (H. K. Lewis, 1912, price 3s. 6d.), which has been considerably added to and thoroughly revised. It is a reliable guide to the subject.

Materia Medica and Pharmacy, by R. R. Bennett, B.Sc.(Lond.), second edition (H. K. Lewis, 1912, price 4s. 6d.). This neat little volume presents in a readable way the drugs of the pharmacopœia and their preparations. The author has arranged the drugs under a pharmacological classification. The book is one which can be recommended to students preparing for their professional examination on the subject.

REPORTS AND TRANSACTIONS OF SOCIETIES.—During the past few years the Research Laboratory of the Department of Health for the City of New York, under the able directorship of Dr. W. H. Park, has been turning out work of the highest quality bearing on the scientific aspect of various problems arising during public health administration. The extended series of researches on the pneumococcus have now been published in special form, *Report of the Medical Commission for the Investigation of Acute Respiratory Diseases of the Department of Health of the City of New York* (Part I., Studies on the Pneumococcus), and constitute a very thorough study of the morphology of this organism and of allied bacteria. The value of the work is evidenced by the fact of the frequency to which references to it occur in current bacteriological work on the subject, and the conclusions arrived at are now generally accepted. A knowledge of the contents of this volume is a necessity for all working bacteriologists.

The latest volume of the *St. Thomas's Hospital Reports* (J. & A. Churchill, 1912) contains, in addition to the usual statistical and critical reports of the different departments, the results of a useful investigation into the subject of suprapubic prostatectomy from 1906 to 1910.

The *Transactions of the American Urological Association*, edited by Charles Greene Cumston (Riverdale Press, Brooklyne, Mass , 1912), include the papers read at the annual meetings held at Chicago in September 1911 and at New York in April 1912. The papers are of considerable scientific and practical interest, and are well worthy therefore of permanent record. The range of subjects is a comprehensive one, so that there is abundant material to instruct the general surgeon and the practitioner. The illustrations, which are numerous, chiefly depict X-ray appearances. The respective merits of perineal and suprapubic prostatectomy afford once again a lively subject for discussion.

BOOKS RECEIVED.

BIDWELL, L. A. Minor Surgery. Second Edition . . (*Frowde, Hodder & Stoughton*) 10s. 6d.
BIEDL, A. Innere Sekretion. Vol. I. Second Edition . . (*Urban & Schwarzenberg*) 24 mks.
CROOKSHANK, F. G. Flatulence and Shock . . . . . (*H. K. Lewis*) 2s.
EVANS, W. Diseases of the Skin . . . . . (*Frowde, Hodder & Stoughton*) 10s. 6d.
KIRKPATRICK, T. P. C. History of the Medical Teaching in Trinity College, Dublin
. . . . (*Hanna & Neale*) 7s. 6d.
LAIRD, J. Notes on the Treatment of Tuberculosis . . . (*Wright & Sons*) 2s. 6d·
LINDIE, K. W. English Echoes from the Quartier Latin . . . (*Elkin Mathews*) 1s.
MARTINDALE, W. H. Digitalis Assay . . . . . . (*H. K. Lewis*) 2s.
NISBET'S Medical Directory, 1913 . . . . 8s. 6d.
ROSENAU, M. J. The Milk Question . . . . (*Constable & Co.*) 7s. 6d.
RUMPF, T. Arzt und Reichsversicherungsordnung . . . . . (*Bonn*) —
SUTHERLAND, G. A. The Treatment of Diseases in Children. Second Edition
(*Frowde, Hodder & Stoughton*) 10s. 6d.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL NOTES.

The Tragedy of the Antarctic.

NOTHING that has happened in our time has so deeply moved the heart of the nation as the loss of Captain Scott and his companions of the southern party on their return journey from the South Pole. The simple setting of the scene, the brief last message penned in the very presence of death, and the noble appeal with which that message closed have left on the mind of the people an impression that cannot be effaced. Of all the emotions that crowded in upon us as we read the news, perhaps the strongest and the most abiding was one of pride — pride that our race can still produce men who could do the work these men did, and die the death they died.

As members of the profession of Medicine we cannot afford to deny that the thought that one of our own calling was numbered in that band of brave men brings to us a certain melancholy sense of gratification and pride. To the memory of EDWARD ADRIAN WILSON, the chief of the scientific staff of the expedition, we would here offer our humble tribute of respect and admiration.

Presentation Portrait of Sir William Turner.

ON Thursday, 13th February, the Chancellor, the Right Honourable Arthur J. Balfour, accepted on behalf of the University a portrait of Principal Sir William Turner, painted by the President of the Royal Scottish Academy, Sir James Guthrie. Sir Robert B. Finlay, Member of Parliament for the University, made the presentation in the name of the pupils, colleagues, and friends of the Principal, who desired in this way to express their appreciation of Sir William's services to the University as a teacher and administrator, and their affection and esteem for him as a man.

Those who shared in this movement, so ably and expeditiously carried through by Sir Ludovic Grant and Professor Lodge, are deeply gratified by the kindly action of Sir William Turner in deciding to present to each subscriber a copy of the picture, which is to be reproduced under the personal supervision of the artist.

Promise and Performance.

"THE idea of these special arrangements was . . . to cover a case of this sort : Supposing you had a medical man in a district who did not care to go on the panel, either because his practice did not quite lie in that direction, or because he had a rooted prejudice to contract practice, but at the same time there was a workman who had great confidence in

him.   The doctor had been attending him and his family with great care and skill for years, and had pulled him through many troubles, and the workman said, 'Well, I would rather stick to my own doctor, and I would rather stick to him even if I had got to pay myself.' It was felt that there ought to be a power given to allow the insured person to make special arrangements wherever you had a case which came within that description." These are the words of the Chancellor of the Exchequer, uttered on 2nd January last, and if they do not convey a promise, a pledge, an undertaking, then language has lost its meaning. The Scottish Insurance Commissioners and the Edinburgh Local Insurance Committee have refused to implement the undertaking, and it remains to be seen whether the Chancellor of the Exchequer will sanction their refusal, and will explain that, after all, he did not intend his remarks to apply to a case like ours, or will take steps to see that his words are fulfilled.

The facts in Edinburgh are perfectly clear.   There are about 130 practitioners on the panel, and there are probably nearly 100 who from the nature of their work might have gone on the panel, but for various reasons have not done so.   Nearly four thousand persons applied for permission to make their own arrangements with these medical men. The Local Medical Committee, consisting of an equal number of panel and non-panel representatives, recommended that permission should be given.   The Insurance Committee rejected this recommendation, and granted the applications only to persons in the employ or residences of non-panel doctors, to persons already ill and under treatment, to persons undergoing homœopathic treatment, and to the staffs of certain medical charities.

Now it is a matter of common knowledge, and a fact which the Insurance Committee cannot deny, that among the practitioners whose patients' applications have been rejected there are many who have long practised in the city, who have a rooted prejudice to contract practice, in whom working-class patients have great confidence, who have attended them with skill and care for years, whose patients would rather stick to them even if they had to pay themselves—in a word, men who might have stood as the originals of Mr. Lloyd George's fairy tale, for by the decision of the Local Insurance Committee that is all it comes to be.   Had they so willed, it would have been perfectly easy for the Committee to have made a selection of the applicants in the sense indicated, and although any selection must have borne hardly on some, it would at least have been an attempt to carry out the spirit of Mr. Lloyd George's promise.

The contrast between the meaning of "special arrangements" as interpreted by Mr. Lloyd George and as defined by the Executive is made all the more evident in the Memorandum of the Insurance Commissioners, which gives as the special circumstances in which the insured

person may desire to obtain medical attendance otherwise than by practitioners on the panel, special disabilities or advantages arising out of the nature of occupation, and the desire for a particular form of treatment not undertaken by panel doctors. Not a word here about the Chancellor of the Exchequer's trusted family physician and the workman he has pulled through many troubles. The contrast almost amounts to contradiction.

Let Mr. Lloyd George "take the straight course" on which he once plumed himself at the Kennington Theatre celebration. Let him see to it that the undertaking implicit in his speech on 2nd January is given effect to in *bonâ-fide* cases (there will be no difficulty in finding them) by insurance committees. Let him ensure that his words at the London Opera House are translated into facts : "No doctor is forced by the Act to take contract practice ; no patient is forced to take a doctor on contract unless he wishes to." If he does not, his critics may fairly retort that his promises are as "gassy" as the invective to which he shows himself so sensitive.

The Rockefeller Institute. THERE has recently been issued by the Rockefeller Institute for Medical Research a pamphlet giving an account of its development and present organisation. This cannot fail to attract the attention of all who are interested in the conditions under which medical research is now carried out.

In 1901 Mr. Rockefeller pledged himself to give a sum of £40,000 a year for ten years towards promoting research under a board of directors, and in the following year he added to this obligation a gift of £200,000 for the purpose of building an institute which was opened in 1906. A further development of the scheme was the provision in 1910 of a hospital of seventy beds for the study of disease as it actually appears in human beings, with a special view to the elaboration, under scientific control, of new methods of treatment. Further gifts for endowment came from Mr. Rockefeller, so that at present the capital funds amount to over £1,680,000, and in addition to the Central Institute there is now a farm and a marine biological laboratory. The Institute is under a board of scientific directors, consisting of Dr. Hermann Biggs, Dr. Prudden, Professor Welch, Dr. Flexner, Dr. Holt, Dr. Janeway, and Dr. Theobald Smith. The laboratories are divided into departments of pathology and bacteriology, of chemistry, of physiology and pharmacology, of experimental biology, and of experimental surgery, each of which has at its head a member of the Institute, and all being under the general directorship of Dr. Simon Flexner. Under these there is a staff of whole time scientific workers, classed, according to their seniority, as Associate Members of the Institute, Associates, Assistants, Fellows and Scholars, and at the end of 1912

the total staff was composed of forty-five workers. The scientific equipment of the Institute is of the most elaborate character, so that every branch of research may be carried on under the most favourable conditions.

The hospital which adjoins the laboratories is a building of eleven storeys, and, looked on merely as a hospital, is the most elaborately equipped establishment of the kind in the world. Its peculiar and essential feature, however, is that while the patients who enter it know that they will have the advantage of the most recent methods of treatment, the main object of their being there is to afford material for the scientific study of disease. This fact might conceivably have militated against the facilities offered being taken advantage of, but we understand that the contrary is the case, and that more patients apply for admission than can be accommodated. The cases are so selected as to bear on a limited number of subjects chosen for investigation at one particular time. These in the first year were acute lobar pneumonia, acute poliomyelitis, syphilis, certain types of disturbed metabolism, and certain types of cardiac disease. The hospital, like the laboratories, is under a director in this case chosen for his clinical experience, and the staff consists of a salaried resident physician and assistant resident physicians, all of whom must have already shown aptitude for scientific investigation along clinical lines. The clinical staff is reinforced by special workers in chemistry, pathology, bacteriology, and physiology.

If we proceed to ask what results have been obtained by this great organisation we get an answer from the fifteen volumes of studies already issued from the Institute, and which include some 1400 papers dealing with all branches of medical science. Many of these, perhaps the majority, are concerned with the careful investigation of minute points not yet condensed together to constitute an epoch-marking advance in knowledge, but in several cases arresting results have emerged. Amongst these may be classed the work on bacillary dysentery, on the serum treatment of cerebro-spinal meningitis, and on the pathology of acute poliomyelitis, with which Flexner has been intimately associated. In experimental surgery there is the work of Carrel on the transplantation of organs, and in experimental biology we have Loeb's researches on the mechanism of cellular division and on the artificial fertilisation of ova. Of the detailed researches ripening towards a greater fruition are those of Noguchi and others on the chemical basis of immunity reactions, and those of Carrel on the artificial culture of living tissues. This is no mean record on the scientific side, and augurs well for what is likely to be attained from the hospital where development is still in progress.

The success of the Institute raises many questions of intense and urgent interest. To those who think in millions it is an object-lesson of how the expenditure of what after all is a comparatively small sum

may be made not only to enlarge the knowledge of the world but to decrease the burden of human suffering, for if we take cerebro-spinal meningitis alone, already many lives have been saved by the work of the Institute. Mr. Rockefeller by his gift must thus be looked upon not only as a munificent patron of science but as a benefactor of the human race.

The success of the Institute suggests another consideration, namely, that for future great advances in medical sciences a financial equipment hitherto undreamt of is an essential. It is common to say that the man of outstanding ability may change the face of knowledge with very insufficient laboratory resources, but if this is to be made an excuse for withholding proper aid, it had best be held to be untrue. Such a position would ignore the changes which have taken place in the nature of the problems now requiring solution. To put the matter crudely, the easy questions have been answered, and to answer those that remain, the man of ability can do nothing without the application of the most elaborate and costly methods. The simple apparatus sufficient for determining the proportions of nitrogen and oxygen in air must be expensively elaborated before neon and crypton can be measured, and similar facts are true for all branches of science.

New questions also arise as to the organisation which in the future is to be necessary for medical research. The Rockefeller Institute is evidently adapted to the conditions prevailing in New York, which up till recently has not been an outstanding university centre, and it finds its counterpart under somewhat similar conditions in the Lister Institute in London, the success of which, within the limitations of its own resources, has been equally marked. But is the divorce of scientific medicine from teaching and from ordinary hospital conditions to mark the future evolution of the medical schools of Britain, of which the Edinburgh school is typical? The answer to this is not yet clear. No doubt an urgent necessity is the multiplication of whole-time senior research appointments, and the more effective organisation of clinical material is called for so that more knowledge may be gained of disease as it actually occurs. It appears, however essential for the equipment of men sent out from a school into practice that they should be saturated with the most recent advances in scientific medicine, and this can only come from their teachers being themselves actually in the fighting line.

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The Last Illness of Napoleon.

THE plain, prosaic clinical history of the humblest hospital patient has perhaps a greater educational value than the carefully edited records of the illness of one of the great ones of the earth, even when authenticated by the signatures of the magnates of medicine. The simple story of A. B. may lack the piquancy which attaches to that of one whose name

has been on every lip, but it stands as a plain, unvarnished statement of facts, with nothing to hide, nothing to explain away, nothing to discount, and we read it without that feeling of intrusion which seems to restrain us as we read the intimate sickroom records of the great.

The interminable controversy regarding the nature of the illness to which Napoleon Bonaparte succumbed on 5th May 1821 has been opened afresh by the publication of Dr. Arnold Chaplin's book.* It must be confessed that the records of the captivity do not form pleasant reading for British readers, and to us as medical men the chapters dealing with the illness and treatment of the august prisoner bring little comfort. Even when we bear in mind the comparatively limited resources of medicine in Napoleon's day it is impossible to resist the conviction that the provision made for his care and treatment was far from adequate. The opinions of the various attendants who were in turn assigned to Napoleon were throughout influenced more by political considerations than by such scientific knowledge as they possessed, and the prospect of their own professional advancement was too often allowed to override the interests of their patient.

For his facts Dr. Chaplin has relied on the "Lowe Papers" in the British Museum, which contain the daily reports of the physicians responsible for the treatment of the patient, and it appears to us that he has brought forward sufficient evidence in support of his thesis that the gastric cancer which eventually proved fatal was engrafted on a chronic ulcer of the stomach.

Professor Arthur Keith † has investigated afresh the specimens in the Hunterian collection of the Royal College of Surgeons, which are alleged to have been surreptitiously removed at the post-mortem examination at St. Helena, and presented by O'Meara to Sir Astley Cooper. In spite of Professor Keith's able argument there is still room for doubt as to the authenticity of these relics, but if they are genuine the microscopic evidence which he has produced throws valuable light on the nature of the early symptoms of Napoleon's last illness, and does something to rehabilitate the sorely battered clinical reputations of O'Meara, Stokoe, and Antommarchi.

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The Disuse of Alcohol. It is notorious that the customary use of alcoholic beverages has declined in recent years. Temperance is in vogue among all grades of society. Just as a generation ago sherry and biscuits were replaced by the five o'clock cup of tea, so now is whisky and soda at meal times being supplanted by innocuous if uninteresting barley water, or minerals with their accompaniments of wind and righteousness. Not less remarkable is the fall in the drink

* _The Illness and Death of Napoleon Bonaparte_ (London : Hirschfeld Bros., Ltd., 1913).

† _Brit. Med. Journ._, January 11, 1913.

bill of hospitals, and the gradual disuse of alcohol, founded on a better knowledge of its pharmacology, in the treatment of disease. In short, temperance is now the fashion, and a good fashion too—so good that an optimist might be pardoned for jumping to the conclusion that progress in the right direction, having begun, will never be checked, and that mankind's great curse, inebriety, is passing into history. It is so much easier to speculate on the future from our impressions of to-day than seriously to study the present in the light of the facts of the past, that Mr. Webb's work on the consumption of alcohol in the United Kingdom * is profitable reading. Although it in so far confirms the general impression as to show, unquestionably, that the consumpt per head of liquor has fallen, his paper tends to correct the too sanguine view that temperance, having begun its march, will continue uninterrupted and unstayed. Accurate statistics of the consumption of alcohol through half a century are now available—from 1860 onwards. Looking to the total consumed it is found to run in cycles, two of increase, two of decline. From 1860 to 1875-76 the consumpt of wine, beer, and spirits rose steadily; from 1876 to 1885-87 it fell; from 1887 to 1899-1900 it rose again; from 1900 to 1910 it declined, and now there are indications of a fresh cycle of increase. These fluctuations apply also to the amounts consumed per head of the population, but with this difference: whereas the second maximum, about 1900, was higher than the previous one of twenty-five years earlier as regards total consumpt, it was lower per head of the population. It is interesting to learn that the ebb in the course of consumption during the early eighties was, as now, ascribed to the growth of temperance principles, with favourable augury. Thus Sir Algernon West (Report of Commission on Depression of Trade, 1886) says "the gradual decline in the consumption of alcoholic beverages must mainly be attributed to the growth of temperance habits among the people . . . it is beyond all doubt that the [temperance] movement continues . . . to exercise a large amount of influence on the drinking habits of the community." These and many other such *dicta* were uttered on the very eve of the upward trend of consumption which lasted for about thirteen years.

The rhythmic rise and fall depend, Mr. Webb believes, on variations in the spending power, quite as much as on the morals, of the community. There is a very high correlation ($+ \cdot 82 \cdot 93$) between "real wages" and consumption of alcohol. "Real wages," it may be explained, are index numbers calculated from actual money wages after making allowance for rents and retail prices. Mr. Webb's curves of real wages and consumption of liquor show a striking coincidence. "During the first period of increasing consumption the trend of real wages was upward, rising fairly rapidly at the average annual rate of 1·8 per cent. During the next period, while consumption was downwards, the upward trend of real wages slackened off to only 0·5 per cent. per year,

i.e. it was almost stationary. During the third period, when consumption again took an upward flight, the upward trend of real wages was also fairly rapid, averaging 1·7 per cent. per year. Finally, during the recent period of declining consumption the trend of real wages was actually downwards, averaging 0·2 per cent. per year."

Real wages are on the up grade now, and it is not improbable that the Exchequer officials were right in budgeting last year for a normal increase, instead of a normal decrease, from the liquor duties. Even if, however, the consumption of alcohol should again rise, two circumstances favour the advance of temperance—First, the consumpt per head has never risen so high as forty years ago, when the average Briton drank in one year one and a third proof gallons of spirits, three bottles of wine, and just under a barrel of beer (in 1910 he still drank three-quarters of a barrel of beer, but his spirits had fallen to a half, and his wine to less than a half, of the former figure). Secondly, the cult of health is practised now as never within living memory. People are learning, and anxiously seeking, how best to keep well, and no measure of personal hygiene is more important than moderation in the use of alcohol. The sanitarian is the modern apostle of temperance.

The Morison Lectures will be delivered in the Hall of the Royal College of Physicians by Dr. George M. Robertson, F.R.C.P., on the 10th, 12th and 14th March 1913, at 5 P.M.

The Twelfth International Congress of Ophthalmology. THE Twelfth International Congress of Ophthalmology is to be held at St. Petersburg from Monday the 10th to Saturday the 15th August 1914 (British reckoning) under the presidency of Professor L. G. Bellarminof. It is intended to hold four morning sessions for discussions, and one afternoon will be reserved for demonstrations.

The last congress held at Naples in 1909 under the presidency of Professor Arnaldo Angelucci selected two subjects for discussion at St. Petersburg, namely (1) The Etiology of Trachoma, and (2) The Nutrition of the Eye

The committee now invite suggestions as to other subjects for discussion, and intimate that members who wish to communicate reports to the Congress must send their MSS., with the enrolment fee, to the Central Bureau at St. Petersburg Ophthalmic Hospital, Mochowaja 38, addressed to the General Secretary, Dr. Th. Germann, not later than the 1st of February 1914. The communications must be typewritten in one of the official languages of the Congress—English, French, German, Italian, Spanish, or Russian, and should not exceed five pages in length. Communications in French will probably appeal to the largest audience.

The subscription is 25 francs for each member of the Congress and 10 francs for each individual of a member's family who may desire to attend also.

Later notification will be given as to reduced railway fares and other privileges to which members may be entitled.

The correspondents for Great Britain are—Dr. Walter Jessop, 73 Harley Street, London, W. ; Sir H. R. Swanzy, 23 Merrion Square, N., Dublin ; Dr. George Mackay, 20 Drumsheugh Gardens, Edinburgh.

INQUIRY INTO OUTBREAKS OF FEBRILE ILLNESS, WITH RAPIDLY FATAL CASES, OCCURRING IN A BOYS' INDUSTRIAL SCHOOL NEAR EDINBURGH.

By CHARLES McNEIL, M.A., M.D., M.R.C.P.Ed., and J. P. McGOWAN, M.A., M.D., B.Sc.

THE school in question lies 9 miles east of Edinburgh, between Tranent and the seashore. It contains at present about 170 boys drawn from the poorest classes of the large town-populations of the East of Scotland, who are admitted because of destitution, or after commission of petty criminal offences. Their ages range from 5 to 16 years, but the great majority are from 10 to 16 years. After about the age of 10 years the boys are "half-timers," *i.e.*, receive the ordinary school education for one-half of the day, and during the remainder engage in various "trades"—upholstery, gardening, tailoring. There is also a resident staff, consisting of the superintendent with his family, and of the various teachers, and the important fact may be mentioned at the outset that the staff have shown a complete exemption from the outbreaks of illness affecting the boys.

This school was founded in 1889, but it was not till the spring of 1900 that the first outbreak occurred, though isolated cases of illness are recorded previous to this date which appear to resemble them in character. For convenience we may apply the term "epidemic" to these outbreaks, not implying that they are akin to an ordinary epidemic of infectious disease (for it will be shown later that there is an absence of evidence of contagion in these outbreaks) but merely as a convenient term to describe the occurrence of cases of illness in simultaneous groups. A series of such epidemics has visited the school up to 1911, some of a few weeks' duration, others running over several months. It has been possible to separate roughly eleven of these groups in all. The last epidemic occurred in the spring of 1911, at the close of which we were asked by the Home Office to investigate the whole matter and report. (The following communication is an abstract of our report, which will shortly be published by the Scottish Office.)

The clinical features of the illness may now be generally indicated. It will be seen that three distinct types occur. The first, of which we have collected 20 cases in the above period, is of short, acute, and rapidly fatal illness; the second of pneumonia of a very peculiar and irregular character; the third is an uncomplicated but severe febrile attack. A few examples will suffice to define the clinical picture of these three types.

GROUP I.—*Acutely Fatal Illness.*—1. "James Mulholland, æt. 14, was found dead in bed on the morning of 18th June 1901, with froth and blood about the mouth and nostrils. He went to bed the night before apparently well." One other such case of a boy being found dead in bed, without signs of previous illness, occurred in this group.

2. W. Boyle, æt. 11. Had been 4½ years at school. He was thought to be a healthy boy, and was of good physique and fresh complexion. On the morning of 28th April 1911 he complained of headache, and vomited. He was put to bed and rapidly improved. In the afternoon he was seen by the matron at 5.30, and seemed well and free from any discomfort. At 5.45 he complained to the sickroom boy of the return of headache. At 6.40 this attendant called the matron, saying that Boyle could not be wakened. He was found quite unconscious, with foam about the mouth and nostrils, and died in a few minutes. Duration of illness about 10 hours.

3. R. S., æt. 14. Admitted to hospital on 29th May 1901 at 6 P.M. He was quite cold and blue, and by 1 A.M. of the 30th he was almost unconscious. He revived for a short time and complained of pains in his arms and legs. He died at midday on the 30th.

These three cases illustrate fairly well the general character of the illness in this first group, an illness remarkable for its rapidly fatal issue. Of the 20 cases in the group, 12 died within a day, and all within 48 hours from the onset of symptoms.

GROUP II.—*Pneumonia.*—One example will suffice. H. C., æt 15. "On the evening of 19th April 1903 felt quite well before he went to bed. Several boys who were playing with him just before 'fall in' say he was all right. During the night vomiting and headache came on. He was removed to the sickroom on the morning of the 20th. On that day his condition closely resembled that of the fatal cases—puffiness and cyanosis of the face, coldness of extremities, and restlessness. His pulse kept fairly good, though his temperature rose to 105 . He developed slight pneumonia, but he was out and about on 30th April. Herpes present."

But in this group there were such variations in the clinical features that a brief summary is better adapted to give a general idea of the character of the illness. Thus in Epidemic II., April-June 1901, there were sixteen cases of pneumonia, and in no case was rapidity of breathing noted, though a trained nurse was in attendance, and records of pulse and temperature were kept.
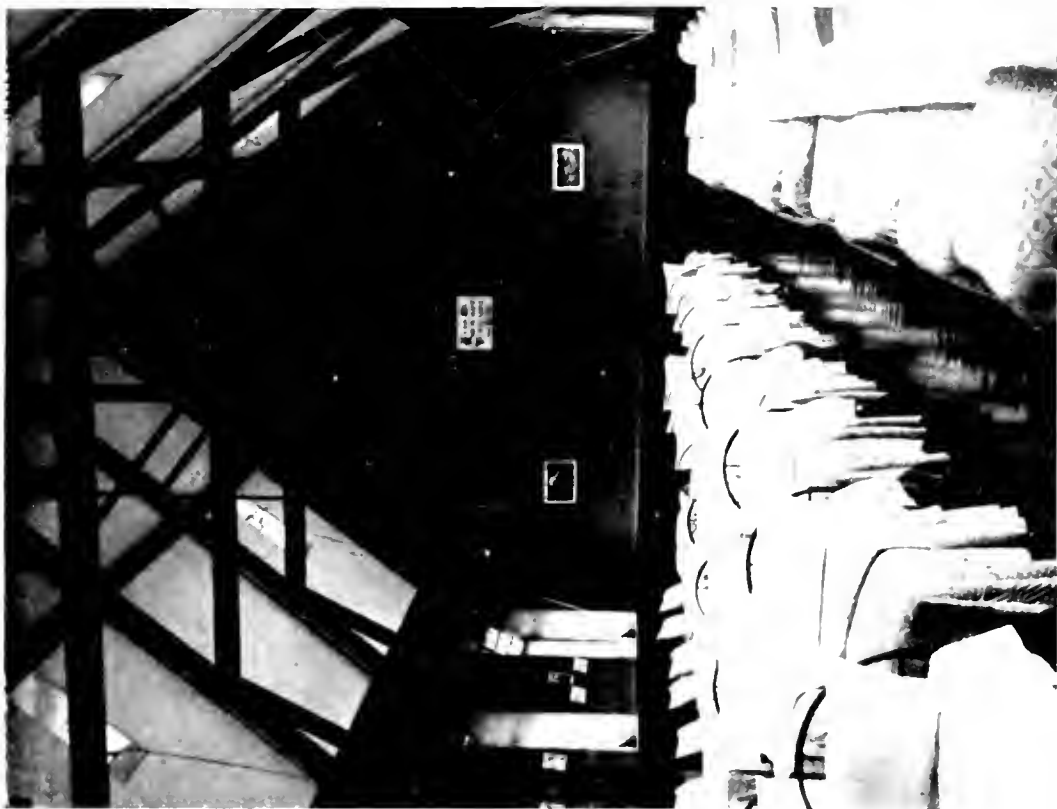
Fig. 3.—Large dormitory at central school. Note high roof and polished floor.

Rusty sputum was only noted in four cases, while in some (4) it is definitely stated that throughout the course of the illness there
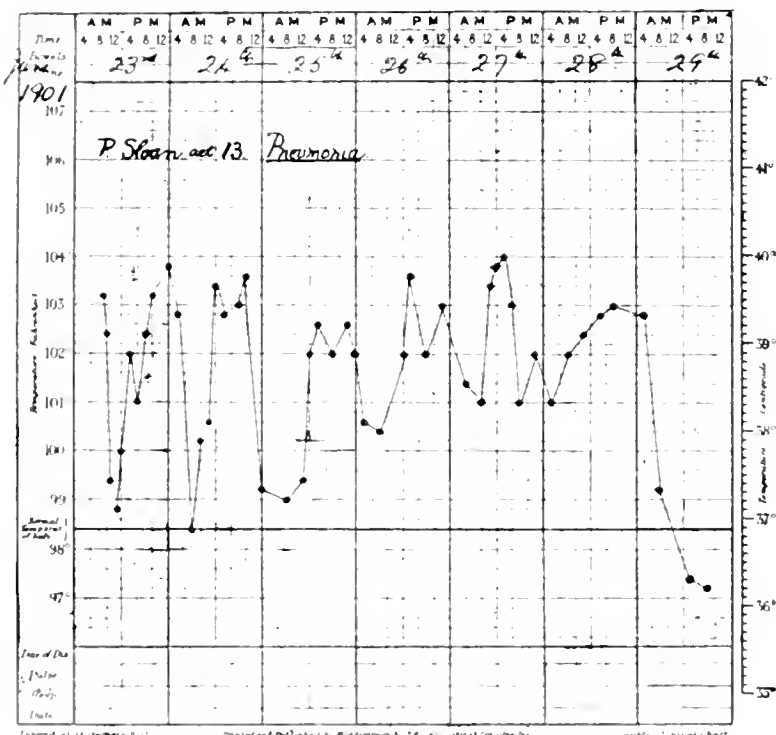
Fig. 4. Temperature chart from case of pneumonia. Note the large, irregular, and sudden oscillations.
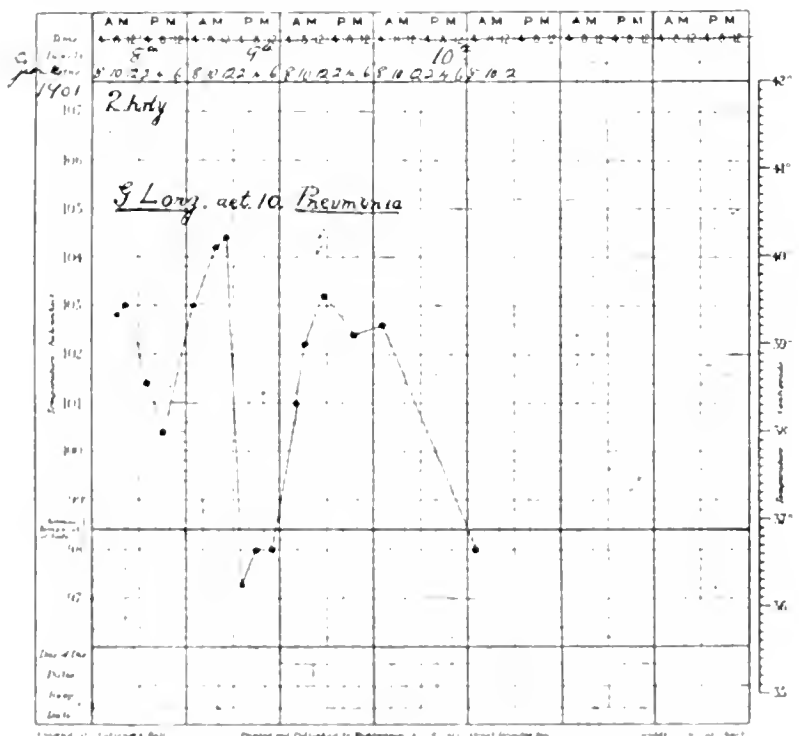
Fig. 5. Temperature chart from case of pneumonia. Note the absence of the secondary rise.

was neither cough nor expectoration. The temperature in the severer cases was high, but with very irregular and often large

fluctuations (see Fig. 4). Several of the cases showed a sudden fall of temperature after the initial rise, and a secondary rise which was coincident with the development of signs and symptoms of pneumonia (see Fig. 5). The extent of lung consolidation was generally small (in a very small proportion was it lobar in extent), so that in the language of the medical officers it could be covered by the chest-piece of the stethoscope. In the period 1900-1911 we have collected 51 cases of pneumonia.

GROUP III.—*Febricula*.—Examples need not be given of this group, since in their onset and course they closely resembled the group of pneumonias, except that evidence of lung consolidation was wanting. Several of the cases showed that peculiar temperature curve—an initial and secondary rise—which was present in a few of the pneumonias (see Figs. 6 and 7). Total, 175 cases.

Common Clinical Characters.—But though the outbreaks of illness showed this separation into three types, there was in each sub-group an underlying similarity, indicating that all were variations of a single disease. These common features may now be detailed :—

Onset.—The initial symptoms were common to all, and were headache, vomiting, and high fever, developing with exceptional suddenness, and attended with great prostration. In a considerable number this onset occurred during the night. In no case was a definite rigor noticed, though this possibly may have been missed; in one or two the boy was noted as shivering. It is worthy of note that diarrhœa was never present either at the beginning or during the course of the illness.

Course.—In the course of the illness certain striking features were present in each of the groups. These may be conveniently arranged under various headings :—

Mental and Nervous Phenomena.—Coma and delirium were present in varying degree in a large proportion of cases. Deep coma was practically always present at some stage in the acutely fatal illnesses. A slighter degree of coma or stupor, noted as a "dreamy," "dull," or "apathetic" condition, with or without some delirium, was very common in the cases of pneumonia and febricula. In addition, a peculiar mental irritability was noted in some of the cases, especially in the fatal group, the boy violently and almost savagely resenting interference of any kind. In four cases of febricula the patient temporarily sank into deep coma, and in appearance exactly resembled the condition of those in the fatal group.

Such signs as sharp pains in the back and limbs, severe
muscular cramps, and twitchings of isolated muscles or portions of
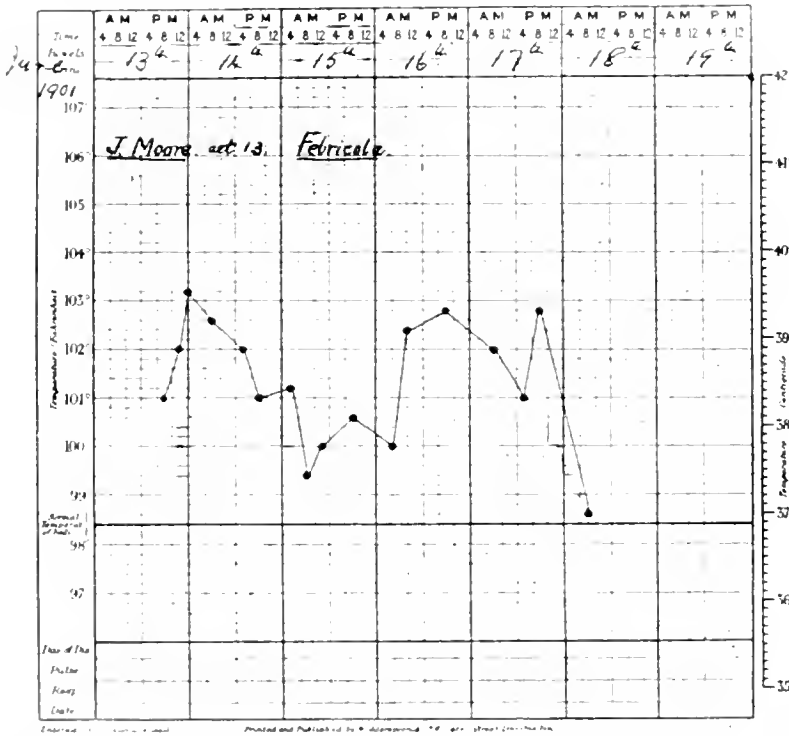
Fig. 6.— Temperature chart from case of febricula. Note initial and secondary rise.
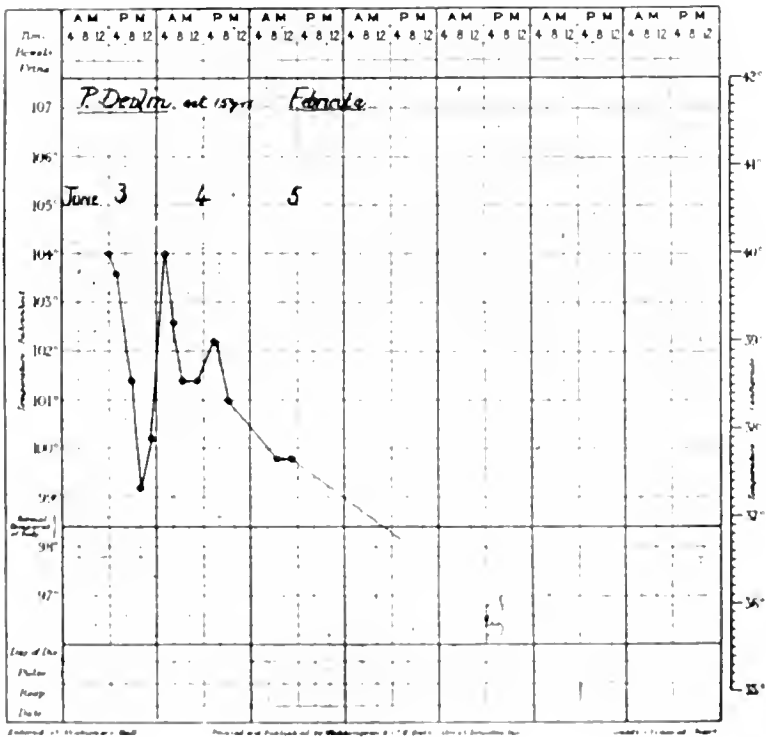
Fig. 7.— Temperature chart from case of febricula. Note initial and secondary rise.

muscle, were present in a fair number of cases in each group. They
may indicate a meningeal involvement.

Vasomotor and Circulatory Phenomena.—Marked cyanosis of face and limbs, usually associated with a feeling of cold, was a peculiar and striking feature of many of the cases in each of the three groups. This cyanosis was sometimes noted to vary from time to time, appearing and disappearing; this was particularly so in the fatal group.

In all severe cases the pulse was fairly rapid, and often noted as very weak and irregular; and in some of the fatal cases sudden alterations in rate were noted—sometimes even an acceleration of 40 beats per minute after slight exertion.

Respiratory Phenomena.—The *respiration rate* was but slightly affected. In some of the fatal illnesses Cheyne-Stokes respiration was present. In the cases labelled pneumonia, and especially in those under close observation in the Royal Infirmary, the grunting, short, laboured breathing, characteristic of typical lobar pneumonia, was notably absent.

Cough and sputum were as frequently absent as present in the cases of pneumonia. The sputum is occasionally mentioned as rusty, but never as sticky. A most important fact noted in several of the fatal cases under observation in the Royal Infirmary was the presence of slight cough, with scanty saneo-purulent sputum. This observation gives these cases a valuable link of connection with the cases of pneumonia.

Equally relevant is the record of blood-stained froth found about the nose and lips of two of the cases found dead in bed in school.

Other Phenomena.—*Herpes* is said to have been present in a large number of cases of pneumonia and febricula in the earlier epidemics. In Epidemic II. the records examined by us show that it was present in six out of sixteen cases of pneumonia, and in two out of five cases of febricula. It was never recorded in the fatal group.

The *blood* was examined in the Royal Infirmary cases, and in all showed polymorpho-nuclear leucocytosis, reaching a high degree in the acutely fatal illnesses (maximum, 75,000 per c.mm.), but being only moderate in the other cases.

The *urine* was not recorded in the great majority of cases. In the Royal Infirmary cases it showed in one or two cases a trace of albumen, and in two cases, not otherwise characterised by great severity, a little blood and a few casts were present for a short time. In only one case do we find an estimation of the chlorides —in a case of pneumonia, where they were found diminished.

Summary of Clinical Data.—These clinical data which have been presented may now be summed up. They fairly strongly indicate one morbid condition, manifesting itself in three clinical types. This morbid condition resembles acute pneumonia more closely than any other, but deviates from the classical type. It may be described as a distorted pneumonia: being fulminant in the acutely fatal group; irregular and apparently lobular in character in the group labelled pneumonia; and abortive or latent in the group of febriculas. The occurrence of these outbreaks over a course of years shows the existence of these peculiar forms of pneumonia, not merely in epidemic, but also in endemic form.

VARIATIONS IN CHARACTER OF EARLIER AND LATER EPIDEMICS.
CHART OF EPIDEMICS AT TRANENT. 1900-1911.

Year.	Season.	Acutely Fatal Illness.	Pneumonia.	Febricula.
1900.	Feb.-June.	2	13	None recorded.
1901.	April-June.	6	16	5
1902.	April-May.	0	2	8
1903-04	Dec.-Jan.	2	1	0
1904.	March-Sept.	6	4	5
1905.	Jan.	0	3	1
1905.	May-Aug.	0	3	16
1906.	July-Aug.	0	3	2
1906-07.	Nov.-April.	1	4	19
1908-10.	...	...	...	...
1911.	Jan.	1	0	10
1911.	March-April	2	2	109
Totals, .		20	51	175

These variations are well shown in the table of epidemics given. In the earlier epidemics, and especially in I. and II., there was a preponderance of the acutely fatal illnesses and of pneumonia. Thus from 1900 to 1901 there were 16 cases out of a total of 20 in the fatal group; and in the same period 36 out of a total aggregate of 51 pneumonias. On the other hand, febriculas have been more numerous since 1904; and this prominence of the slighter form of illness is very remarkably seen in the epidemic of March-April 1911, when out of a total of 113 cases 109 were cases of febricula. Further, this later increase of cases of febricula may well be an underestimate, as in the medical record during this period isolated illnesses and small groups of illnesses resembling them frequently occur.

STATISTICAL DATA AS TO INCIDENCE OF SEASON, AGE, OCCUPATION,
DURATION OF RESIDENCE IN SCHOOL; ALSO AS TO DURATION
OF ILLNESSES, CONTAGION, AND RECURRENCE.

Seasonal Incidence.—The epidemics, though generally occurring
in the colder seasons of the year, and especially in the spring
months, happened on two occasions during summer and autumn.
We endeavoured to discover if any correspondence existed between
the seasonal occurrence of these outbreaks and the death-rate
from pneumonia, bronchitis, and pleurisy in the neighbouring
burgh of Tranent, in the county of Haddington, and in the city of
Edinburgh. Figures were very kindly furnished to us by Dr. J.
C. Dunlop, Superintendent of Statistics, Register House, Edinburgh.
But we found no evidence of coincidence between the school out-
breaks and the prevalence of acute respiratory disease at the same
age-periods in these adjoining areas.

Age-Incidence.—Here there was great difficulty in reaching any
conclusion. We obtained the ages of all the cases of illness included
in the epidemics, but it was impossible to get the age constitution
of the whole school at the time of each of the various outbreaks.
At the time of our investigation this constitution was roughly that
the great majority of the boys were of ages 10 to 16; and over all the
epidemics the three forms of illnesses were also by far the most
numerous during these age-periods. The only conclusion indicated
by the figures was that there is no special age-incidence in any of
the three forms of the disease.

Occupation.—Details of occupation could only be obtained for
the last epidemic. The majority of the boys are "half-timers,"
spending half of the day at some occupation or "trade." The
various trades are upholstering, tailoring, gardening, and house-
work. There was a heavier incidence on the first three trades,
the upholsterers being especially affected (in our opinion due to
the very dusty atmosphere in this shop). On the whole, however,
we do not believe that occupation has any marked influence.

Duration of Residence in School.—This table was compiled to see
if there were any relation between the duration of stay in the school
and liability to attack by the disease. Excluding periods short of
one year, no connection could be traced.

Duration of Illness.—With regard to the acutely fatal illnesses
this has already been dealt with. As to the pneumonias, the
duration of illness was in 70 per cent. ten days or more. In the
febriculas it was in 75 per cent. of cases six days or less.

Evidence of Contagiousness. — Evidence here could only be

obtained with regard to the last epidemic. This was afforded by noting the incidence of cases in the seven dormitories from day to day. On the first day of the outbreak (13th March 1911) 17 cases occurred, and these were distributed fairly evenly over all the dormitories. This even distribution continued throughout the epidemic. In this outbreak the evidence seemed decisive that the illness was not a contagious one, *i.e.*, not conveyed from boy to boy.

Recurrent Cases.—Twenty-six cases of recurrence throughout the epidemic period were collected. In most there was but one recurrence, but in 7 cases there were two. Two of the cases of sudden death had had attacks of febricula at some previous period.

Immunity of the Staff and Attendants.—It is worthy of note that at no time did the staff or members of their families suffer from illnesses resembling those the subject of inquiry, either during the period of the different outbreaks, or at any other time.

Similar Outbreaks in Other Industrial Schools.—We failed to obtain any account of similar outbreaks occurring in the general population, but they are by no means unique. Yet the remarkable fact is that they have been apparently confined to industrial schools of this character. In a number of these schools have similar outbreaks occurred from time to time, and in several cases these outbreaks have been the subject of investigation and report. From these reports it is clear that the illnesses are of identical nature. They show the same epidemic and endemic character; they include the extraordinary cases of sudden death, or of short illness terminating fatally in most cases under 24 hours; the irregular cases of pneumonia; and the sharp uncomplicated febrile attacks. These three forms occur together in outbreaks, sometimes one form preponderating, sometimes another. And in their clinical manifestations also the resemblance is equally perfect.

Some points, indeed, which received little notice, or were in themselves not prominent in the school which was the subject of our inquiry, are thrown into greater relief in the other schools. Thus herpes was present in a high proportion of cases of febricula in an epidemic at Hounslow in 1885, and this was associated in the same class of case with a marked reduction of chlorides in the urine, two valuable pieces of evidence in favour of these cases of febricula being closely related to pneumonia; while in Dartford, Kent, out of an epidemic of 102 cases 40 showed hæmaturia—a condition which was noted in 2 of the infirmary

14

cases in the present inquiry, but which does not seem to have been looked for in the cases occurring in school.

We have collected accounts of outbreaks of this character in industrial schools at Hounslow, London (1885);[1] Dartford, Kent (1891);[2] Ainsdale and Freshfield, Lancashire (1897);[3] Parkhead, Glasgow (1878);[4] Abercromby Street, Glasgow (2 schools) (1888);[5] Chadwick Memorial School, Newcastle (? 1902).[6] These various schools included two for girls, in whom the illnesses assumed the same types and a similar clinical course.

Further, by tracing the medical records of these schools, so far as they are contained in the Annual Reports of H.M. Inspectors, it is shown that these outbreaks have taken place over a series of years, both before and subsequent to the various published investigations. Their endemic character is thus firmly established.

It is highly probable that this form of illness, which we have described as irregular pneumonia, is even more widely distributed throughout industrial schools, though not in so severe a form as to attract attention. We are convinced of this, both by a perusal of the medical records of other schools in the Annual Reports just mentioned, and also by the fact that in another industrial school close to Edinburgh, which we selected as a control to certain observations made in Tranent School, there are at an earlier period of its history indications of the existence of this endemic illness, in the occurrence of more than one case of rapidly fatal illness, of scattered cases of pneumonia, and of groups of illness styled "influenza," "gastric catarrh," etc.

Post-mortem Findings.—Post-mortem examinations were made only in the cases of acutely fatal illness, and in these, twenty in number, in fourteen cases. One case, that showed at autopsy the appearance of localised inflammatory disturbance on the meninges, has been excluded from this category. But there falls to be added to the list a case of sudden death occurring after our investigation was completed. This was in a boy, J. Hughes, æt. 12, who died suddenly on 30th October 1911, and who showed post-mortem appearances which connect his illness with those of the suddenly fatal group. These fourteen autopsies may now be analysed. It should be said that in several of the earlier autopsies the records are very incomplete.

Lungs.—In only one case, and that in the second autopsy, of which the record is very fragmentary, were the lungs noted as normal. In every other case their condition is described as one
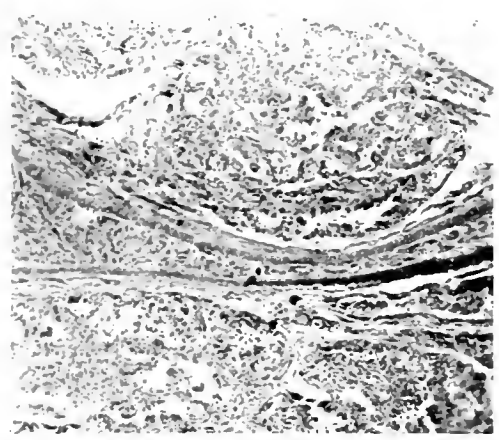
Fig. 8.—Thyroid gland. L.P. Case W. B. Fulminant pneumonia; duration of illness, 12 hours. Showing extreme hyperplasia, absence of colloid, irregularity of shape of follicles, proliferation and irregularity of epithelium, and thickening of fibrous stroma.

Fig. 11.—Thyroid gland. H.P. Also from F. B. Showing high power view of large acinus.
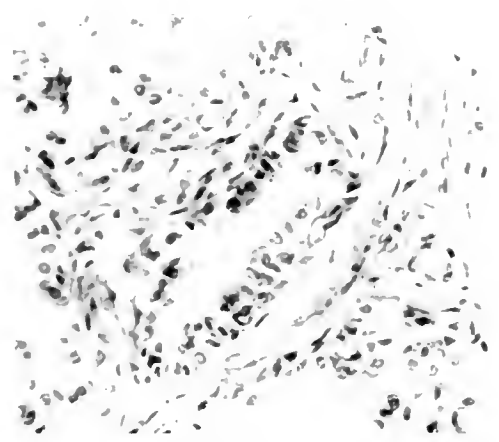
Fig. 9.—Thyroid gland. H.P. From same case. Showing columnar change in epithelium; also irregularity and catarrh.

Fig. 12.—Thyroid gland. L.P. Case T. H. Fulminant pneumonia (complicated); duration, a few hours. Showing extreme hyperplasia as in Fig. 8.

Fig. 10.—Thyroid gland. L.P. Case F. B. Fulminant pneumonia; duration of illness, a few hours. Showing marked hyperplasia; similar to that in the case of W. B. Note the very altered irregular acini.

Fig. 13.—Thyroid gland. L.P. Case McC. Lobar pneumonia; duration, a few hours. Showing colloid in acini, and less hyperplasia.

of acute general congestion, or of irregular patchy pneumonia, sometimes single, sometimes double. In no case was its distribution lobar, a fact not at all surprising in view of the very brief duration of the illness. But this finding of pulmonary congestion or consolidation is by far the most constant of all in these autopsies. Its presence at this early stage of illness seems to make it a primary change, and to contra-indicate its being merely a secondary or terminal phenomenon of some other acute infectious process (see Figs. 17-19).

Brain and Spinal Cord.—In no case was meningitis found. The surface of the brain was, when examined, found to be engorged in some cases, and in others pale and rather dry, with flattening of the convolutions. No naked-eye changes were found in the spinal cord.

Lymph-Glandular Tissues.—Considerable importance is attached by us to the condition of these tissues. The fact that in many cases no mention is made of them must not be taken as indicating that they were free from morbid change.

Thymus.—This was noted in five cases. In one the note is "not abnormal," in the other four it was enlarged, or much enlarged; and in one of these the weight is given as 22 grms.

Lymph-Glands.—In several cases the mesenteric glands are noted as enlarged.

Lymphoid Tissue of the Alimentary Tract.—Enlarged tonsils and adenoids and prominence of the lingual papillæ are described in one or two cases (see Fig. 16). The Peyer's patches and solitary glands of the ileum are in several cases recorded as enlarged. Prominent solitary glands in the duodenum are twice noted; while in one case an increase of submucous lymphatic tissue in the stomach was observed microscopically.

Spleen.—Where the spleen is recorded it is generally noted as enlarged, with prominent Malpighian corpuscles (see Fig. 15).

Thyroid.—In three of the last four autopsies the condition of this gland was noted. Twice it was noted as enlarged to the eye. In all, on microscopic examination, it showed very marked alteration. The chief features of this change were extreme hyperplasia of the epithelial cells with great irregularity, great distortion of the shape of the follicles, reduction or absence of the colloid substance (*qua* staining reaction), capillary engorgement, and considerable thickening of the fibrous stroma (see Figs. 8-12).

Bacteriology.—In 8 autopsies bacteriological examinations were

made. In all pneumococci were obtained from the lungs, and in several from many organs and tissues — the blood, brain, cerebro-spinal fluid, spleen, liver, and kidney. From several cases a variety of other organisms, most of which could not be identified, were obtained. Thus in R. A. (sectio by Dr. Shennan, 2nd June 1904) it is noted—"Large bacilli, with some filamentous forms, were found in the right lung. Some short bacilli were found in a culture made from the base of the heart, and later on organisms developed in a culture from the mesenteric glands, which appear to be the same as those in the heart and right lungs. These killed animals in 30 hours." Also in F. B. (sectio by Dr. Shennan, 16th January 1911)—"A great variety of organisms, whose nature was not fully identified, were obtained from the various organs." Similar observations were made in W. D. (sectio by Dr. Shennan, 14th March 1911), and in T. H. (sectio by M'Gowan and M'Neil, 31st October 1911). In the latter (T. H.) organisms of the Gaertner group were specially looked for in the intestines and tissues and were not found; on anaerobic culture coliform bacilli were obtained from the brain, liver, small and large intestines.

In the cases that were under observation in the Royal Infirmary, sputum obtained during life always showed pneumococci. In the case of T. S. (18th August 1904), who recovered, an examination of the sputum by Dr. Shennan showed "chiefly pneumococci, and also a flattened diplococcus. There are a few bacilli which do not stain well. A few leptothrix forms can also be distinguished. In culture none of the bacillary forms appear, but both of the others can be readily got." This note is significant, showing the presence of other organisms along with the pneumococcus in the lungs during life.

Post-mortem Findings in Similar Cases in Other Schools.—The autopsy records here are scanty, but they generally confirm the appearances just described in the lungs and brain. With regard to lymph-glandular tissues, enlargement of the mesenteric glands, the Peyer's patches, and solitary glands of the intestine were recorded in several cases. In no case was the condition of the thymus noted. In Coupland's report bacilli were cultivated from the lungs of one case, which did not correspond in character to pneumo-bacilli; they possibly were of the same class as those noted in several of the Tranent cases.

Summary of Post-mortem Findings.—It must be remembered that these deal only with the group of acutely fatal illnesses. The

conclusion from the clinical records of these cases was that they were examples of fulminant pneumonia. The appearances of the lungs at autopsy confirm this description. The general enlargement of the lymphatic tissues, including the persistence of an enlarged thymus, noted in a few cases, and imperfectly suggested in several more, seems to offer an explanation of the rapidly fatal course of this type of pneumonia. If this explanation is correct, these pneumonias owe their malignant and rapidly fatal character to the pre-existence in the patient of the status lymphaticus. The extreme thyroid hyperplasia observed in three of the last four cases may very well be just as significant and essential a mark of this obscure diathesis, termed the status lymphaticus, as the enlargement of the lymphatic glandular tissues of the body. Wynn,[7] in a series of 20 cases of classical status lymphaticus, has found this marked thyroid hyperplasia in all.

Physical and Bacteriological Examination of the Present School-boys.—This was carried out shortly after the close of the last epidemic in April 1911. The examination was of two kinds—a physical examination, made as complete as seemed desirable; and a bacteriological examination of the secretions of throat and nose, made with special reference to the presence of pneumococci, which the previous clinical and pathological records had indicated as important causal factors. Each examination was made in the case of every boy in the school—178 in all.

The facts obtained were checked by similar observations made in an adjoining school (9 miles away), whose boys were drawn from the same levels of society and generally from the same districts, *i.e.*, mainly from the slum populations of Edinburgh, Dundee, and other industrial centres of the East of Scotland. These control observations were not made over the whole school, but in a group of 42 boys selected at random, but proving fairly representative of the whole school, both in age-constitution and other respects.

Physical Examination.—In the official report of the inquiry the percentage figures under various headings are given at length, but here it will be sufficient in most cases to give general descriptions of our findings.

Nutrition and Development.—In both schools the boys appeared well nourished and sturdy-looking, but data of height and weight for Tranent school proved to be considerably below the averages for similar ages of the general population as given by Roberts. This defective growth may very well be due to the conditions of their previous and not their present environment. The bulk of

the boys do not enter school till they are 10 years or upwards, and have up till then spent their lives in very unfavourable conditions. Data of height and weight were not obtained in the control school.

Heart, Lungs, and Abdomen.—In each school a few cases, proportionately equal in number, were found of latent heart disease. In neither were cases of active pulmonary tuberculosis found nor of chronic abdominal tuberculosis.

Skin and Scalp.—At Tranent there were 8 cases of slight localised eczema, mostly of the face, as against none in the control. In both the condition of skin and scalp was scrupulously clean.

Eyes.—Here, first, some difference emerged between the two schools. The condition of the conjunctiva was the point examined. This was in Tranent school affected in various ways, but the most characteristic and frequent condition was a chronic granular or follicular conjunctivitis, nearly always confined to the palpebral conjunctiva of the lower lids. This condition is frequently noted in the medical records of the school, and generally described as "trachoma." This term is in our opinion a mistaken one. It has generally been most evident in the colder seasons of the year. There was a percentage of 13·5 (24 boys) in Tranent school showing this condition, as against none in the control. The significance of this condition will be alluded to later. But conjunctival affections of all kinds were 37 per cent. at Tranent, as against 9·6 per cent. in the control. It is worth noting here that eye troubles are a conspicuous feature in the medical records of all the schools that have suffered from these peculiar outbreaks of illness, and that they are evident in the record of the control school at a period when there are signs of its having been affected to some extent with these illnesses.

Mouth, Nose, and Throat.—The condition of the teeth was good in both schools, the advantage lying with the control. With regard to the nose, there was some difference, there being a greater amount of internal swelling and injection and of chronic nasal discharge in the Tranent school.

Throat.—Cases of enlarged tonsils and of adenoids (determined by the finger) were equally numerous in both schools. This is a curious and noteworthy fact. But at Tranent there was a greater amount of what may be termed general slight adenoid hypertrophy of the posterior pharnyx, a condition which was visible but not palpable—66·8 per cent., as against 35·7 per cent.

Cutaneous Tuberculin Reactions (v. Pirquet's Test).—V. Pirquet's

test for tuberculosis was applied to 170 boys in Tranent school, and to 169 boys in the control school—*i.e.*, practically to the whole school in each case. The positive reactions were 59 per cent. in the former, and 14 per cent. in the latter. This remarkable difference seems at first sight difficult to explain, and all the more so as the medical record of Tranent school shows fewer cases of phthisis and other clinical forms of tuberculosis than the control school. Undiluted tuberculin and the same technique were used in both schools, and a large previous experience with the test may fairly exclude gross experimental error. There is, however, an explanation, and it is one that gives a curious and valuable corroboration to our previous conclusion that status lymphaticus was present in the cases of acutely fatal illness.

The skin reactions were unusually intense in Tranent school. In the three most extreme cases there was a large central vesicle $\frac{1}{4}$-inch diameter, with a thick papular base of $\frac{3}{4}$-inch, and a surrounding areola of 1 to $1\frac{1}{2}$ inches (26 to 39 mm.) in diameter. But apart from these, a large proportion of the reactions were unusually large in area and vivid in colour. In the control school the reactions were of the ordinary kind. Escherich, in a paper on the "Scrofulous Diathesis," specially draws attention to hypersensitiveness to tuberculin tests in scrofulous children, who clinically show chronic blepharitis, chronic nasal discharge, thick upper lip, and weeping eczema (a clinical picture which is faithfully reproduced in a group of boys at Tranent). He declares that these are cases of tuberculous infection *associated with status lymphaticus*. The cutaneous tuberculin reactions in such children are, according to him, never under 10 mm., and may reach to 30 or 40 mm. in diameter.

The results of the tuberculin tests at Tranent may then be explained as follows :—They indicate localised tuberculous foci, the majority probably in glands, the original infection having taken place before admission to the school, and in many cases early in childhood. The associated condition of status lymphaticus has served to intensify both focal and local sensitiveness, and this reactive sensitiveness has resulted in limitation of the foci and prevented in most cases a wider spread of the tuberculous process. If Escherich's interpretation is correct, it indicates that the lymphatic diathesis is widespread throughout Tranent school. It of course gives no information as to how and when that diathesis has been induced. In boys free from tuberculous infection (41 per cent.) this diathesis may also be present.

Superficial Lymphatic Glands.—The lymphatic glandular groups in the sides of the neck, axillæ, and groins were examined in both schools. In both a small multiple glandular enlargement was extremely common, and was present in nearly equal proportions. There was certainly no greater involvement of these superficial lymphatic glands in Tranent school. In view of what has been said as to status lymphaticus, it is necessary to make this negative fact clear.

Thyroid Gland.—In not more than two cases at Tranent was the thyroid gland enlarged to clinical palpation.

Below, a tabular statement is given of the chief points of difference between the two schools:—

	Eyes (Conjunctival Affections).	Nose— Evidence of Discharge.	Enlarged Tonsils.	Adenoids.	Tuberculin Cutaneous Test, Positive Reactions.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Tranent school .	37·0	50·0	61	47·2	59
Control .	9·6	11·9	65	45·2	14

In brief, the differences between the two schools were that in Tranent school there was a considerably greater amount of conjunctival inflammation, much of it being of old standing; also of chronic nasal discharge; that the slight amount of skin trouble present at the time of our examination (early summer) was absent from the control school; that the frequency of enlarged tonsils and of adenoids was practically equal in both; and, finally, that there was a remarkable preponderance in positive tuberculin reactions in Tranent school.

Bacteriological Observations.—(*a*) We made observations as to whether there was any special prevalence of pneumococci in the upper respiratory passages of the boys at Tranent. A portion of the secretions of the nose and throat in each boy was removed with a platinum loop, rubbed up in saline, and injected into a mouse. At death, films of the heart blood were examined for pneumococci, and various further cultural tests employed (production of acid and clot in inulin-serum water, and absence of hæmolysis on serum, blood-agar, etc.). By these means pneumococci were found in 62·5 per cent. at Tranent (179 boys), and in 61·9 per cent. at the control school (42 boys). These figures seem to prove that the presence of the pneumococcus in the above percentage at Tranent cannot of itself explain the occurrence of the outbreaks. With the exception of one or two cases of pneumo-bacilli in both schools

no other organisms were identified from the upper respiratory passages.

CONDITIONS OF ENVIRONMENT—AIR-SPACE, VENTILATION, HEATING, ETC., IN THE TWO SCHOOLS.

With regard to questions of environment, corresponding data were obtained in both schools. In situation both are in the same geographical area, and are approximately equally exposed to weather conditions.

Air-space, etc., of Dormitories.—The following table gives the average air-space and other data per boy in each school:—

	Cubic Space per Boy.	Floor Space per Boy.	Window Space per Boy.
Tranent school A.	360·6 cubic feet	30·6 square feet	4·3 square feet
Control B.	640·7 (393·7) ,,	29·5 ,,	6·9 ,,

There are two figures given for cubic space in the control school. This is because of the ∧-shaped ceilings of the dormitories. In the larger figure this gable-space has been included; in the smaller figure it has been left out. School B. is superior to A. in respect of air-space and window-space of the dormitories. This superiority also extends to the living rooms, schoolrooms, and workrooms, which in the control school are more modern, more roomy, and better lighted. In wet weather, and in winter, the space available for recreation is much greater in school B. than A.

Heating.—The dormitories and passages of the buildings are steam-heated in the control school B.; they are not heated in any way in Tranent school A.

Occupation.—The trades at Tranent school include that of upholstery, in which the boys engaged are much exposed to the dust of old horse-hair stuffing. The two fatal cases in the last epidemic were upholsterers.

Clothing.—Both in body- and in bed-clothing the boys of the control school are much more warmly covered than in Tranent school. In our opinion the boys at Tranent are insufficiently clad, especially in the colder seasons of the year.

Diet.—We have not been able to trace any connection between the food and the occurrence of these illnesses. A comparison of the dietaries of the two school shows a rather more generous allowance of meat and milk in Tranent school. The diet here was carefully considered in an investigation by Dr. J. S. Haldane in 1904, and a

new schedule was then drawn up, which has since been further improved. In neither school could the diet be described as abundant, but we have failed to obtain evidence that it is insufficient. The quality of the food supplied to Tranent school is excellent.

The hypothesis of poisoning by tainted fish has been put forward at various times. The clinical features of the illnesses do not support this. The fact that the last two epidemics occurred at a period during which no fish was either brought to the school or used as food is strongly against this possibility.

Water.—The supply is that of the neighbouring burgh, which, to our knowledge, has been free from illnesses of this kind. Water, in our belief, has nothing to do with the outbreaks.

Summary.—In the various conditions of environment the boys at Tranent are, in our opinion, unduly exposed to cold, both from their too scanty clothing in the cold seasons and also in the lack of heating arrangements in the dormitories and passages of the institution. There is also an inadequate allowance of air-space in the dormitories, which may, to some extent, be mitigated by the free ventilation which is maintained.

Views as to the Nature of Similar Outbreaks in Other Schools.— Dr. Scott,[4] Medical Officer to the Parkhead Reformatory, writing of an epidemic in that school in 1878, says : " I am not satisfied the disease is infectious. Nor can I consider it as pathogenic pneumonia ; and I am inclined to think . . . that it is somewhat like influenza, and that the septic poisoning is auto-inoculative."

Dr. Russell, Medical Officer of Health for Glasgow, reporting on the Abercromby Street school outbreaks in 1888, suggests that they might be " an anomalous manifestation of enteric or typhus fever," but admits there is little evidence in support of this.

His report includes a note upon the clinical aspects of the illnesses by Sampson Gemmell, who says that in these illnesses they " had to deal with a disease allied to the acute specific fevers. . . . The speedy issue in the four fatal cases finds its closest analogue in the so-called malignant forms of epidemic disease. . . . It is impossible with our present light to dogmatise regarding the exact nature or genesis of the disease."

Parsons, in his account of an epidemic at an industrial school in Dartford, Kent, concludes it was one of severe influenza, the fatal cases being of fulminant type.

Coupland, reporting on the Birkdale and Freshfield outbreaks, says that " in all probability we have in those cases of inexplicable

febrile illness, ushered in by alarming symptoms, and occasionally fatal within a few hours, examples of a class of disease which in its less virulent form has the definite and well-recognised character of acute pneumonia. . . . But even this hypothesis does not take us very far. We have still to account for its undue prevalence, and for its peculiar type, as exhibited in these various outbreaks."

General Summary and Conclusions.—It will be convenient now to bring together the conclusions we have formed regarding these outbreaks, indicating briefly and finally the evidence on which these conclusions rest.

1. These cases of febrile illness are cases of pneumonia; fulminant in those acutely fatal; irregular (apparently lobular) in the group designated pneumonia; and abortive or latent in the group febricula. In all three groups there were common features, the manner of onset and certain prominent clinical manifestations in their course showing them to be variations of a single morbid condition. Pneumococci and blood-stained sputum were obtained from cases in each group during life; and pneumococci were cultivated from the lungs after death in the fatal cases.

2. These forms of pneumonia show a great distortion of the classical type. This deviation is chiefly in two directions—an absence or paucity of clinical symptoms and signs of pulmonary consolidation, and a great prominence of signs of severe poisoning of the central nervous system.

3. The diagnosis of pneumonia does not therefore afford a complete explanation of these outbreaks. It does not explain the occurrence of the three types, nor the very irregular character of these types. Other important features requiring explanation are the epidemic and endemic character of the outbreaks, and their occurrence as such in a good many schools of this class.

Broadly, there are two alternative hypotheses which may be put forward in explanation—

(*a*) Some other organismal agent is co-operating with the pneumococcus.

(*b*) There is present and pre-existent in the boys some abnormal constitution of body altering and distorting the usual reaction to the pneumococcus.

(*a*) In connection with the first hypothesis, in several autopsies bacilli, which did not correspond to known types, were obtained from the lungs and other tissues, in addition to pneumococci. That these were not always of post-mortem growth is shown by their discovery in the sputum in one case during life. We cannot with

our present evidence decide whether these other bacteria are active agents in these illnesses, or merely play some passive and secondary *rôle*. But in this connection two facts seem important—the absence of evidence of contagion among the boys themselves, and the escape of the resident staff from infection ; these facts seem to weigh against these other bacilli being essential or directly causal agents.

The possibility of poisoning by tainted fish has been dealt with. It seems to be excluded.

There was no special prevalence of the pneumococci in the upper respiratory passages of the boys at Tranent, and those found did not differ in morphological, cultural, and biological characters from those found in the control school.

(*b*) In a significant proportion of the autopsies various lymph-glandular tissues of the body were noted as enlarged, and in four out of five cases where the condition of the thymus was recorded this organ was hypertrophied. Those appearances are such as are found in cases of sudden death during anæsthesia, and from other trivial causes, and are ascribed to status lymphaticus. We put forward the hypothesis that the rapidly fatal cases are examples of pneumonia occurring in boys in whom the morbid diathesis termed status lymphaticus is present.

In support of this conclusion there is evidence that in some rapidly fatal cases of other forms of infectious disease status lymphaticus is present. Thus through the kindness of Dr. Claude Ker we obtained the thymus and thyroid glands from a case of scarlatina maligna, dying 24 hours from the onset of symptoms, with a completely suppressed rash. The thymus was much enlarged, weight 19 grms., and the thyroid showed that extreme hyperplasia which was present in three fatal cases in Tranent school, where this gland was microscopically examined (see Fig. 13). Again, in diphtheria, Daut[9] has published a considerable series of fatal cases, death occurring early in the illness and usually with unexpected suddenness, where the classical post-mortem appearances of status lymphaticus were found. It seems probable that examples occur (and may have been recorded) in other forms of infectious disease.

4. If the cases of pneumonia and febricula are less severe variations of the same disease as the acutely fatal illnesses, a like explanation of their irregular character would require to be made for them, and would be found in the existence in them also of an analogous, though probably less marked, condition of body. That

is to say, we have in this school the existence of the so-called status lymphaticus not in a few but in many boys, not merely at one time, but endemically over a number of years. In fact, if our interpretation of the facts be correct, we are dealing with endemic status lymphaticus, a condition which, so far as we know, has not hitherto been described. In support of this some clinical evidence was obtained from the examination of the present boys. There was, firstly, the prevalence in them of a peculiar form of chronic conjunctivitis in which there was hypertrophy of the adenoid tissues in the conjunctiva, associated with chronic rhinitis. Secondly, there was the unusual frequency and peculiar character of the tuberculin skin reactions, associated by Escherich with status lymphaticus. If Escherich is right, the application of his view is a striking corroboration of the above conclusion.

5. Status lymphaticus has hitherto been commonly associated only with cases of death occurring suddenly from a variety of trivial and insufficient causes. If our conclusions are correct the term must now be enlarged to cover rapidly fatal cases of infectious disease, usually termed fulminant, including such cases of pneumonia, of scarlet fever, of diphtheria, and probably of other infectious disease. The condition may also play a part in non-fatal irregular cases of pneumonia such as have been described at length in this paper, and it may very well be found to explain atypical forms of other bacterial infections.

This enlargement of the term status lymphaticus, as shown in these curious outbreaks of distorted pneumonia, affords an opportunity of studying more closely the nature and the causes of this obscure morbid diathesis, both in its sporadic and endemic forms of occurrence. This further study, however, does not fall within the scope of the present paper, and will be reserved for a future communication.

In the prosecution of our inquiry we have received indispensable help in the matter of information, material, and records. We wish to express our special indebtedness, among others, to Professor Littlejohn and Dr. James Ritchie, Superintendent of the Royal College of Physicians' Laboratory, who from first to last have helped us in the most generous manner; to Emeritus Professor Greenfield, who very kindly gave us access to his clinical records of cases in his hospital ward; to Dr. Shennan, Professor Beattie, Mr. H. Wade, and Professor Stuart Macdonald for the use of post-mortem material and records; and to Dr. D. Ritchie,

Tranent, and Dr. G. Matheson Cullen for supplying us with clinical records and details.

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CARCINOMA OF THE STOMACH:[*] AN ANALYSIS OF 200 CASES OF THE DISEASE.

By JAMES LANGWILL, M.D.,

Assistant to the Professor of Clinical Surgery, University of Edinburgh.

THE subject of gastric carcinoma is one of great clinical importance. The disease is extremely common, and it is to be feared that in the minds of the laity, and even in the opinion of many members of the medical profession, it is too often looked upon as inevitably fatal. One of the objects of this communication is to try to prove that it can be cured by operative measures if it is brought under the care of the surgeon at a sufficiently early stage. By the kindness of Professor Caird I have been enabled to collect from his case-books the records of 200 cases of carcinoma of the stomach. These I have analysed, and the results of this analysis are considered under the following headings :—

Age ; Sex ; Complaint and Duration ; Occupation (to a limited extent); History and Symptoms ; Physical Signs ; Blood Examination (to a limited extent); Temperature ; Weight ; Examination of Stomach Contents ; Treatment ; Result (After-History); Post-mortem Records (Microscopic Evidence).

To treat the disease successfully, and at the present time such can only be done by surgical intervention, it must be got at an

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early date, *i.e.*, when it is comparatively localised, for when there is marked glandular invasion it is beyond the limit of the surgeon's power. That it is not hopeless even when a palpable tumour is present is recognised, but the chances of a successful removal are then comparatively small, for it is difficult entirely to remove every glandular focus. It therefore comes to this, that the disease must be suspected and anticipated, and when a due consideration of the case gives grounds for such suspicion, immediate action should be resorted to. Only by such a course, at the present time, will the disease be dealt with at a stage which will hold out prospects of a cure.

I have divided the cases into two groups—"Gastric" and "Pyloric"—(a) *Gastric* embracing carcinoma of the cardiac orifice, the fundus, and the body of the organ; (b) *Pyloric* embracing carcinoma of the pyloric antrum and region of the pyloric orifice.

These two parts of the stomach may be taken as definite entities, the cardiac portion being merely a receptacle for food, while the pyloric portion is the active grinding part.

The latter is the common site of a simple peptic ulcer, which would appear to play a considerable *rôle* in the etiology of many cases of carcinoma of the stomach.

Etiology.—*Incidence.*—All writers show the great frequency of the disease. No organ, taken all over, is more frequently affected. I find that of the 396 admissions to Mr. Caird's wards during the winter 1910-11, there were 73 cases of malignant disease, or 18·4 per cent. Of these, 67 were cases of carcinoma, and 46 of them affected the alimentary tract. Of the 46, 20 affected the stomach.

Sex.—Practically all authors show a great preponderance of the disease in males. In the present series there were 122 males (61 per cent.) and 78 females (39 per cent.). The occurrence of the disease here in so many females is rather striking. They had mainly "pyloric" carcinoma, and were aged between 40 and 50 —a decade earlier than usual. The age at death is also earlier than in men.

Age.—A general review of statistics with regard to age shows that, rarely occurring before the age of 30, the main proportion of cases occurs between 40 and 60, and more especially between 50 and 60. In the present series there were 4 below the age of 30, the youngest being 22. Between 30 and 40 there were 28 cases, or 14 per cent.; between 40 and 60 there were 132, or 66 per cent. The disease may be met with at almost any age. From

time to time cases are recorded in very young people, *e.g.*, 15 and 19. These are usually rapid in their course, and are most often overlooked, mainly because carcinoma is not suspected on account of the youth of the patient.

Heredity.—Most authors state that heredity is not a prominent feature of cancer of the stomach. In the present series a definite family history of carcinoma was obtained in 28, or 14 per cent. Of these, in 2 there was a family history of three cases of malignancy (*e.g.*, father died aet. 84, cancer of bladder; one sister died aet. 57, cancer of stomach; another sister died aet. 52, cancer of breast). In 6 there was a history of two cases of malignancy, and in 20 there was a history of one instance of malignancy. In 17 other cases very suspicious statements were given with regard to family history.

If we take it that 14 per cent. only were definite instances, however, that is a fairly large proportion as compared with the statistics of such writers as Osler and Lebert.

Occupation and Social Conditions.—No particular occupation seems to have any direct bearing on the causation of the disease, and though practically all of the cases in the present series were of the "hospital" class, still its occurrence in those in the upper walks of life is also well known. Of the 78 females, 67 were married women.

Habits.—In the present series 139, or 69·5 per cent., had used alcohol regularly—117 of them moderately, and 22 to excess. Of those who admittedly took it to excess, several took undiluted whisky regularly. Several, too, it may be mentioned, were workers in breweries. The great majority of those in the present series using alcohol were, in both "gastric" and "pyloric" divisions, males.

Previous Diseases.—(a) *Trauma.*—It is unlikely that trauma has any direct bearing on the occurrence of gastric carcinoma. In only one of the present series was a history of trauma elicited, and it occurred two months before the patient came for advice. He had sustained a blow in the "pit of the stomach."

(b) *Previous Gastric Symptoms.*—With regard to this question I have gone carefully into the history of the patients, with a view to finding evidence for or against the growth of carcinoma upon a previous ulcer, healed or unhealed.

Below is appended a table of cases in which a suggestive history of old ulcer was present.

"Pyloric" Cases.

Sex and Age.	Date of Haematemesis before Admission.	Date of Melæna before Admission.	Continuance of Indigestion.	Remarks.
1. Male 58	11 years	6 years	...	...
2. Female 59	...	7 .. (and repeatedly)	...	...
3. .. 48	...	4 years	...	...
4. Male 52	8 years	...	...	...
5. .. 64	14 ..	...	5 years	...
6. Female 48	4 ..	...	20 ..	...
7. Male 52	5 ..	...	...	...
8. .. 58	11 ..	...	...	...
9. .. 50	3 ..	...	...	Acute perforative case.
10. .. 56	2 ..	2 years	...	{ 6 months before admission 11 st. and well. On admission 9 st.
11. Female 52	4 ..	4 ..	...	{ 18 months before admission 12 st. 3 lbs. On admission 7 st. 7 lbs.
12. .. 37	7 ..	...	20 years	...
13. .. 43	24 ..	...	...	...
14. .. 68	30 ..	...	...	...
15. .. 35	8 ..	...	...	...

In all of these 15 "pyloric" cases (7 males and 8 females) definite signs of ulceration were present, and in the majority of cases at a date long antecedent to the probable period of inception of the carcinoma, hæmatemesis in two of the cases having occurred 24 and 30 years previously.

"Gastric" Cases.

Sex and Age.	Date of Haematemesis before Admission.	Date of Melæna before Admission.	Continuance of Indigestion.	Remarks.
1. Male 64	...	38 years.	...	...
2. Female 48	21 years.	...	...	...

Thus 2 "gastric" cases only (1 male and 1 female) showed signs similar to those of the "pyloric" cases 38 and 21 years previously to the probable inception of carcinoma.

Taking the groups together, we have 15 "pyloric" cases and 2 "gastric" cases—17 in all out of 200, or 8·5 per cent.—with definite signs of ulceration before those of cancer were manifest.

One of the cases under present review had had a "gastric" ulcer excised 5 years before. He was then 51. Touch suggested malignancy, but the pathological report stated that the condition

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was *simple*. Nevertheless the patient returned emaciated and with secondary deposits, and died soon after.

If we look at these 17 cases we may infer that definite ulceration occurred in—

1 case two	years before.		2 cases eleven	years before.	
1 „ three	„	„	1 case fourteen	„	„
3 cases four	„	„	1 „ twenty-one	„	„
1 case five	„	„	1 „ twenty-four	„	„
2 cases seven	„	„	1 „ thirty	„	„
2 „ eight	„	„	1 „ thirty-eight	„	„

These seem to be definite cases—8 males and 9 females. There were many others who had suggestive histories of ulcer—13 in number—but no definite signs such as those mentioned, so that one would put down on the basis of history 8·5 as the smallest percentage of carcinoma following upon old ulcer in the present series.

Morbid Anatomy.—In the present series of 200 cases the "gastric" cases, in which, as stated at the outset, are included cases of cardiac orifice and fundal and body of the stomach cases, number 49, or 24·5 per cent. The "pyloric" cases, the term embracing pylorus cases and those of disease of the pyloric antrum (on both curvatures and on both walls), number 151, or 75·5 per cent. Of the 49 so-called "gastric" cases there were 6 wholly cardiac cases, 1 cardiac and anterior wall, 2 cardiac with involvement of the œsophagus, 2 cardiac with lesser curvature involvement, and 1 cardiac with involvement of part of the body of the stomach; in all, 12.

Anterior wall, one of them involving also the posterior wall and one involving also the lesser curvature, 5.

Posterior wall, one of them involving the greater curvature, 2.

Greater curvature, 2.

Lesser curvature, 3.

General carcinoma of the body of the stomach, 25.

Of the 151 "pyloric" cases there were—

(*a*) Implicating the pylorus in large measure with involvement of the antrum pylori in many cases, 99.

(*b*) Affecting the pyloric portion of the stomach mainly on the lesser curvature and mostly on the posterior wall, 38.

(*c*) Affecting the pyloric portion mainly on the greater curvature, 4.

In the remaining 10 cases, which were all pyloric and exten-

sive, either no operation was performed, or the abdomen was merely opened and ascitic fluid removed or adhesions divided.

In 40 cases in which microscopical reports were received, either through operation or post-mortem, the results were as follows:—(1) Columnar-celled carcinoma or adeno-carcinoma, 28 cases, 6· of these undergoing colloid degeneration, 2 showing evidence of old peptic ulcer, 1 in combination with scirrhous cancer.

(2) Spheroidal-celled or scirrhous carcinoma, 10 cases, all pyloric, one showing colloid degeneration.

(3) Encephaloid or medullary carcinoma, 1 case.

(4) Colloid carcinoma, 1 case.

It is interesting to note that from these figures one would draw an opposite conclusion from that drawn by Hale White, who in dealing with colloid degeneration would seem to argue that this degeneration is "much more common in spheroidal than in cylindrical-celled carcinoma," basing his conclusions on 1 out of 12 cases of the latter and 9 out of 32 of the former.

There were two cases of squamous-celled carcinoma of the cardiac orifice, with, in one, the cardia generally affected, and in the other the lesser curvature; but in both, secondary nodules of squamous-celled carcinoma (microscopical examination) in the edge of the liver were present.

(a) *Secondary Cancer of Stomach.*—This is a very rare condition. There were 2 possible cases, both females, in whom the right breast had been removed for "scirrhus" 12 years before in one, and for "tumour" 1 year before in the other.

(b) *Changes in the Stomach.*—There were 24 cases in which the stomach was markedly adherent to the under surface of the liver above and to the pancreas behind, and retracted up under the ribs, the disease at the pylorus being made out only with difficulty *at the operation.* In 6 cases there was marked dilatation of the stomach from pyloric disease, and in one of these the pylorus lay below the level of the umbilicus, and the body of the organ lay in the left iliac fossa. There were several cases with marked pyloric stenosis from carcinoma where the stomach was normal in size. In 16 cases the pylorus was freely movable, and the tumour was most elusive; in 7 cases loops of small intestine were adherent to the growth; in 11 cases the great gut was adherent (either transverse colon or splenic flexure); but in no case was there a definite fistulous communication. In several cases there was evidence of involvement of the bowel wall in the growth, the

meso-colon and mesenteries being shortened and much puckered in addition. In 2 cases the tumour was adherent to the anterior abdominal wall, which was involved, and in these, of course, a very palpable and immobile mass was present. There was no instance of the so-called "leather-bottle stomach."

(c) *Secondary Growths.*—These occurred in the

Lymphatic glands in 104 cases. Duodenum in 5 cases.
Liver in 26 cases. Jejunum in 3 cases.
Peritoneum in 4 cases. Diaphragm in 3 cases.
Omentum in 15 cases. Vertebræ in 3 cases.
Gall-bladder in 6 cases. Pelvis in 3 cases.
Spleen in 4 cases. Colon in 11 cases.
Pancreas in 24 cases. Multiple metastases in 2 cases.
Common bile-duct in 2 cases.

In the cases in which the peritoneum was involved a varying quantity of ascitic fluid was present. In the 4 cases in which the spleen was involved "gastric" tumours had by their proximity, as it were, encroached on the organ. In the 24 cases in which the pancreas was involved the urine was normal; there was no glycosuria. In many cases there was an associated jaundice from involvement of liver, gall-bladder, or bile-duct. The subject of duodenal invasion is interesting. It occurred in 5 cases for a varying distance. They were naturally all "pyloric cases," and 3 of them were males, 2 females. This gives a percentage of 2·5. From the frequent occurrence of simple ulcer here, one would expect that a carcinoma (if such is an after-coming event) would be met with more commonly, especially as duodenal ulcers are very resistant to medical treatment.

Symptoms and Complaints.—In the order of frequency of occurrence these are—(1) Pain; (2) Vomiting; (3) Loss of weight; (4) "Dyspepsia"; (5) Difficulty in swallowing.

I have used the term "dyspepsia" to include water-brash, flatulence, heartburn, feeling of weight, load, or distension in the epigastrium after food. The cases in which dysphagia was complained of were naturally cardiac end cases. Eleven patients complained of *tumour* as the most important and first symptom. In 14 cases the onset of the disease was sudden. In 5 cases the disease was said to have begun with an attack of influenza.

Loss of appetite and a gradually increasing feeling of lassitude were also complained of along with loss of weight. The loss of weight in these cases is a gradually progressive one, so that in males the common condition in which the patient is finally seen

is that the weight has fallen from, *e.g.*, 11 stones to 8 or 9 stones, and in females from 9 stones to 6 or 7 stones in about 6 months. It is a steady fall, and can only be quickly seen if a systematic examination at weekly intervals is carried out. By careful dieting and rest in bed no doubt the weight will be arrested in its fall, or there may even be a gain of a pound or two, but this is soon lost again when the above measures are given up. This is one of the essential and invariable symptoms of the disease.

Anæmia progresses as the disease advances, and, with emaciation, gives the cachexia seen in advanced cases. An average of the blood-counts in 43 cases shows :—

Red blood corpuscles	. .	4,121,057 [3,712,186].
Hæmoglobin	. . .	61·6 per cent. [44·9].
White blood corpuscles	. .	9142.

(The figures in brackets are those of an average of 59 cases cited by Professor Osler.) The "gastric" cases showed a lower red cell count than the "pyloric," also a lower hæmoglobin index, also a higher white cell count. Of the 15 "gastric" cases there were 10 inoperable and 5 died; of the 28 "pyloric" cases 4 were inoperable and 11 died. The carcinomata of the cardiac end of the stomach, *i.e.*, "gastric," impair in greater measure the nutrition, and are more often inoperable than those termed "pyloric." Taken all over, the condition of the blood may be said to have been fairly good, yet it will be seen that such patients did not stand surgical operation well.

Temperature.—154 of the present series of 200 cases (*i.e.*, 77 per cent.) showed a *markedly persistent subnormal* temperature, *i.e.*, between 96° F. and 97° F. or below; 40 (or 20 per cent.) were normal; and 6 (or 3 per cent.) were irregular. The more advanced the cases the more subnormal is the temperature. The temperature falls as emaciation and anæmia progress.

Bowels. — 112 (or 56 per cent.) of the total cases showed marked condition of constipation. Many others showed attacks of intermittent diarrhœa, probably due to the passage of decomposing contents through the pylorus.

Functional Disturbances. — 1. Anorexia and nausea occur very frequently early in the disease. They are very commonly accompanied by the following symptoms :—Discomfort or uneasiness after food; feeling of load, weight, or heaviness; feeling of distension, fulness, swelling, or tightness; eructations (which may be foul-smelling); flatulence; heartburn; pyrosis or water-brash; and regurgitation of mouthfuls of food or fluid, or both.

2. *Vomiting.*—This is one of the most important symptoms, and it frequently occurs early in the disease. It was a prominent symptom in 73 per cent. of the present series. In 17·5 per cent. it was of the nocturnal copious variety. In several cases great difficulty was experienced in getting a clear return by lavage preliminary to operation. In one case, after two large pailfuls of fluid had been used, several currants which had been taken a fortnight before appeared in the return flow. The vomited matter is usually dark in colour, may be of the coffee-ground type, may froth on standing, and is usually foul-smelling and rancid, from butyric fermentation.

3. *Hæmorrhage.*—49 cases (or 24·5 per cent.) had hæmatemesis during their latter illness. In no case was it fatal. I have previously referred to cases in which hæmatemesis suggestive of simple ulcer had occurred at a period of varying duration before the onset of symptoms of carcinoma. Here it may be stated that of these cases, in the "gastric" series there was 1 male and 1 female, in the "pyloric" series 7 males and 8 females. The average age at which the first sign of ulcer occurred was, in the "gastric" series, 25·5 years, and 56 when carcinoma probably began. The average age at which the first sign of ulcer occurred was, in the "pyloric" series, 42·5 years, and 52 when carcinoma probably began. It is interesting to note that in the case of the males in the "pyloric" series the average age at the first sign of ulcer was 48, of carcinoma 55·5 years; and that in the case of the females in the same series the average age at the first sign of ulcer was 37·7, of carcinoma 48·7 years.

When one takes both series together it would appear that the average age at the first sign of ulcer was 40·6, of carcinoma 52·4, i.e., between the first sign of ulcer and the first sign of carcinoma a period of 11·8 years elapsed. In the case of the males the average age at the first sign of ulcer was 45·2, and of carcinoma 56·7, the interval being thus 11·5 years; and in the case of the females the average age at the first sign of ulcer was 36·5, and of carcinoma 48·6, the interval being thus 12·1 years.

4. *Pain.*—170 of the present series complained of pain, which is 85 per cent. It was most commonly epigastric and left hypochondriac, came on usually about 1 hour after, or immediately on taking, food, and more aggravated by solid food. It often shot to the back, and was very exhausting. In most cases vomiting relieved the pain.

5. *Hiccough.*—This phenomenon was present in two "gastric"

cases in the present series. Hiccough may, as pointed out by Carr, be caused by any gastric irritation, *e.g.*, gastritis or cancer. It may be occasioned when the peritoneal coat of the stomach is involved or when the diaphragm is involved.

Examination of Test Breakfast. — Of 49 "gastric" cases, 25 examinations showed as follows :—

Absence of free HCl, as shown by the Gunzburg test   .   =   21
Diminution   ,,   ,,   ,,   .   =   3
Excess   ,,   ,,   ,,   .   =   1

Of 151 "pyloric" cases, 113 examinations showed as follows :—

Absence of free HCl, as shown by the Gunzburg test   .   =   79
Diminution   ,,   ,,   ,,   .   =   27
Merest trace   ,,   ,,   ,,   .   =   3
Excess   ,,   ,,   ,,   .   =   4

Taking the two series together, we have a total of 138 examinations with the following results :—

Absence of free HCl, as shown by the Gunzburg test   .   =   100
    (This is 72·4 per cent. (*cf.* Osler's 89·5 per cent.)
Diminution   ,,   ,,   ,,   = 33, or 23·9 per cent.
Excess   ,,   ,,   ,,   = 5, or 3·6   ,,

From this it will be seen that a total of 96·3 per cent. showed an absence or diminution of free HCl to the Gunzburg test. From a survey of the cases it is clear that those in which free HCl was present or even diminished were in a better condition for operation and stood operation better than those in which free HCl was absent.

Physical Examination.—With regard to this, one is strongly impressed by the ever-recurring history of physical weakness in the patients. Emaciated and sallow subjects, with, in many cases, *visible* tumours and free fluid in the abdomen, they reached the surgical wards too late. Seventy-eight, or 39 per cent., of the cases had *visible* tumours. This is slightly less than the records of Professor Osler, who, out of 150 cases, had 62, or 41·3 per cent.; still it is a large proportion. With regard to peristalsis, one is driven to the conclusion that if longer time were spent in the examination of the abdomen in a good light this important sign of pyloric obstruction would be more frequently seen at an earlier stage than that at which, at the present time, the patients with pyloric cancer are submitted to surgical intervention. The elusive pyloric tumours also would be found at an earlier date. And it is not *one* examination, however long, that is demanded; it is repeated examination,

and at different times of the day and night, that is required. For peristalsis, once seen, no matter how slight, is enough to justify a surgical opinion being asked. In some of the present series the patients themselves described this as if a ball were rolling over the upper abdomen from left to right, and followed the direction with their hands. They stated that for a month or two they had felt this. Occasionally also a "squirting" sensation and audible noise were described and heard as the hypertrophied stomach with difficulty dislodged its contents into the duodenum through its stenosed outlet. At this time also pain was complained of in the abdomen, and in several of the cases where the above account was seen in hospital, a tumour, previously impalpable and invisible, was at length discovered. It had probably been below the ribs on the right side, *i.e.*, under cover of the liver. An important point with regard to physical examination is the question of anæsthesia. In cases of doubt this may be of great service, as in many cases, where no abnormality could be detected previously, when the patient was anæsthetised, a tumour could be felt, and peristalsis became visible. There is no doubt that in many cases, more especially in females, the examiner is at a distinct disadvantage owing to the contraction of the abdominal muscles, but no one should be content with an unsatisfactory examination when there are ways and means of overcoming so-called difficulties. In the great majority of cases epigastric tenderness was elicited; rigidity of the upper part of the recti (especially right) and slight dulness on percussion were present, and it is an important point that in the earliest cases these alone were present on careful examination. With regard to palpable tumours, there were 122, or 61 per cent. (*cf.* Osler's 76·6 per cent.). Of these—

64 or 52·4 per cent. were epigastric in position.
25 ,, 20·4 ,, ,, umbilical.
18 ,, 14·7 ,, ,, right hypochondriac.
13 ,, 10·6 ,, ,, left hypochondriac.
2 ,, 1·6 ,, ,, left lumbar.

With regard to the "gastric" cases (49), a tumour was palpable in 27. These were cases where the body of the organ was involved (the others were cases of cardiac portion and fundus disease). The tumour most frequently lay obliquely from left to right or transversely, coming from below the ribs on the left side (*cf.* the spleen), was tender and fixed, in consistence was irregular, hard (stony or wooden), and varied in size from that of a walnut to a duck's egg.

Of the pyloric cases (151), a palpable tumour was present in

95 cases. The tumour most frequently lay transversely or obliquely (less seldom perpendicularly) from below up to the right costal margin, or came from below the rib margin on respiration, was irregular, stony hard, and varied greatly in size (marble to fœtal head). It was most often to the right of the mid line (*cf.* liver, gall-bladder, or right kidney).

As regards the size of the stomach, of 79 examinations where the lower border was determined, in 36 it was above the umbilicus, in 33 at or about the umbilicus, and in 10 below the umbilicus.

In one case the pylorus lay to the right of the umbilicus, the gastric organ in the left iliac region, where from time to time it stood up in spasmodic contraction, its lower border at the pelvic brim. One concludes on study of the cases that great dilatation of the stomach does not occur so frequently in carcinomatous as in simple stenosis of the pylorus.

Glandular Involvement outside the Abdomen.—Some attention has been drawn to this subject, and the following notes may be of interest :—

"GASTRIC" CASES.

(*a*) Cervical, *i.e.*, supra-clavicular glands, 4 cases { 3 left side. { 1 right „
1. 2 Glands on left side of neck.
2. 1 gland   „   „   „
3. 1   „   „   „   „
4. Several on right „   „

(*b*) Inguinal, 2 cases—
1. Glands on both sides.
2. 1 gland on left side.

(*c*) Axillary, 3 cases—
Glands on both sides.

"PYLORIC" CASES.

(*a*) Cervical, *i.e.*, supra-clavicular glands, 7 cases { 2 left side. { 2 right „ { 3 both sides.
1. Glands on both sides.
2. 2 glands on right side.
3. 1 gland on left side.
4. Glands on both sides.
5.   „   „   „
6. 2 glands on left side.
7. 1 gland on right side.

(*b*) Inguinal, 4 cases—
1. Right side.
2. Both sides.
3.   „   „
4.   „   „

(*c*) Axillary, 4 cases—
1. Left side.
2. Both sides.
3.   „   „
4.   „   „

Course and Prognosis.—The vast majority of cases of gastric cancer last from 1 year to 18 months, but there are acute cases in

which apparently the duration may be limited to 2 or 3 months. An eminent writer on the subject has said, "Of all conditions which influence the rate of progress of cancer in any particular site, I know of none more potent for mischief than the youth of the individual."

In the present series the case of a young woman of 22 is an example of this. The duration of the whole disease was less than 3 months, and here secondary growths were seen daily to increase in size.

Looking at the duration of the disease in the present series when the patient first came under the care of the surgeon, one finds that the following are the histories :—

	Gastric.		Pyloric.		
6 months and under	. 21	+	73	=	94
7 months to a year	. 20	+	43	=	63
1 to 2 years . .	. 5	+	15	=	20
2 to 3 years . .	. 3	+	8	=	11
Over 3 years					12
					$\overline{200}$

Most of the cases with histories of over 18 months or 2 years' duration stated that for the last 6 months they had failed markedly, and it is possible that they had chronic ulcers, and that carcinoma had developed on these (about 43, or 21·5 per cent.).

Diagnosis.—Hale White, writing on the early diagnosis of gastric cancer, says: "It is, I think, clear that there are no means of infallibly diagnosing cancer of the stomach in its early stages, but I do believe that by carefully considering a number of points we might sometimes arrive at a diagnosis earlier than we do, and therefore give the patient the chance of excision, for medicines are powerless to save him." All writers on the subject have laid great stress on the origin of carcinoma in cases with a previously "clean" gastric history. *i.e.*, the onset of gastric symptoms in persons over 45 who have never had any gastric complaint before, and in whom no errors in diet can be discovered. In such cases they urge that if medical treatment fails to effect improvement in a few weeks, they should be considered seriously and a surgeon consulted. But there are many other cases in which the patient has for years been "dyspeptic" or suffered from gastric pain or hæmorrhage, in fact who has suffered from ulcer which has relapsed again and again. These are the patients who, if treated sensibly, would yield astonishing results, for they are as a rule in fair health, are

younger, and would never develop the disease, for that carcinoma does arise on ulcer situated in the stomach is almost certain. In all other regions of the body chronic irritation and ulceration predispose their possessors to carcinoma. It would be most astonishing if it were not so here. No matter then whether a patient has been previously "gastrically" healthy or no, the point which should certainly determine immediate surgical intervention is a progressive diminution in body-weight. A person may suffer from chronic ulcer and yet keep within 1 or 2 lbs. for years, but the onset of carcinoma is associated with an immediate loss, and this above all must be inquired into. It is the one early sign we possess, and is of inestimable importance. With it a diminution in free HCl occurs, and the usual signs given in text-books are late signs, and, as far as surgery is concerned, of little if any use (for complete removal). There are no doubt many cases in which large tumours have been successfully removed, but these stages are risky stages to operate at with any certainty. If a carefully-thought-out case arouses suspicions, it is folly to wait. It is unfortunate that at the present time these cases are treated medically until it is too late for the only hopeful method of treatment, *i.e.*, surgical treatment.

Treatment.—Saundby of Birmingham has written : "Surgical operation in cases of cancer of the stomach has in the past 10 to 15 years been followed by such remarkable results that it deserves greater encouragement." According to Mayo Robson, who has gone into the question of the risks of the operation, 14 to 16 per cent. is given as the immediate mortality, as calculated from a considerable series of cases. The statistics of Mayo within recent years are the most encouraging, *e.g.*, 266 partial gastrectomies, with 34 deaths—an average mortality of 12·4 per cent. Moynihan writes : "The surgical treatment of cancer of the stomach is now based on sound principles," . . . and "the somewhat mournful view of the possibilities of the surgical treatment of cancer of the stomach taken by several writers is not justified." Hey Groves writes : "There is a good prospect of cure in early cases of the disease," and "Exploratory operations should be performed for diagnostic purposes in all doubtful cases."

He advises a two-stage operation, such tending to reduce the immediate operative mortality. The average duration of symptoms before surgical treatment was called was, in his series, 7 months. He states that a most unreasonable delay occurs, and that in his opinion a steady gaining of weight alone renders a postpone-

ment of an exploratory operation justifiable. He also says : " Even in the hands of experienced operators the mortality of the operations for resection of cancer of the stomach is about 50 per cent. . . . This is caused by peritonitis, shock, and lung complications. . . . Remote results of radical operations only give a percentage of 7·6 three-year recoveries of those operated upon." He gives a mortality of 16·6 per cent. as that obtained by the two-stage operation.

With regard to the present series I intend merely to state the details of the treatment carried out and the results accruing therefrom. When one reflects that the first successful gastric resection was performed by Billroth on 28th February 1881 it is rather remarkable that the results at the present time are not more favourable. Below are given the operative results in the present series :—

	"Gastric."	"Pyloric."	Total.
Number of operations, *i.e.* Exploratory laparotomy . . .	48	141	189
(1) Inoperable * . . .	[41	89	130
(2) Considered removable and excision performed .	7	52	59
Of those considered removable—			
Died in hospital, *i.e.* immediate operative mortality .	4	25	29
Left hospital relieved or otherwise	3	27	30

In 11 cases in the present series of 200, no operation of any kind was attempted, owing to the advanced stage of the disease.

The usual duration of life after a palliative operation, *e.g.*, gastro-enterostomy, was about 6 months, and after a mere exploration, 2 or 3 months. After an excision it varied considerably, depending probably on the successful or unsuccessful lymphatic removal.

"Gastric"—3 left hospital, after excision, out of 7. Ages at operation, 32, 45, and 51 : operations in 1896, 1899, and 1905. The second of these was alive and well on 13th November 1911 : was 2 stones heavier (12 years later). Partial gastrectomy

* Of those cases in which operation was resorted to, about 68·8 per cent. were inoperable, either a merely palliative operation being carried out, or the abdomen at once closed. About 31·2 per cent. were thus considered removable and excision performed. Of the latter there was an immediate operative mortality of 49·1 per cent.

for carcinoma of the middle of the stomach with glands had been performed.

"Pyloric" cases, 52 excisions: 27 left hospital. After-history lacking in 10. Death from recurrence occurred in 5—5 months, 9 months, 14 months, 16 months, and 2 years respectively. Death from other causes occurred in 3—one 2 months after from empyaema: one 4 months after from pneumonia; and one 7 years after from uraemia.—P.-M.—No trace of disease—Billroth II. Two reported with inoperable recurrences 10 and 12 months later respectively.

Seven patients were alive and well at varying periods after operation as follows:—3 months, 10 months, 12 months, 13 months, 14 months, 5 years, 15 years—September 1896, aet. 62. Pyloric carcinoma — glands. Kocher's pylorectomy. On 30th October 1911 alive and well, aet. 78.

The greater number of immediate deaths were due to shock, pulmonary complications, and peritonitis. If a patient survived the first week after operation he was usually safe. Haemorrhage, as a rule, never gave cause for anxiety. Fat necrosis occurred in 3 cases. Splenic infarcts occurred in 3 cases. Uraemic symptoms occurred in 3 cases, causing death. In one case the blood-supply of the transverse colon had been interfered with, and in another there was a prolapse of the jejunum through the transverse meso-colon.

General Conclusions.

1. Gastric cancer is probably the commonest form of malignant growth occurring in males. Perhaps with the exception of the uterus and breast, it is also the most common form of malignant growth in females. It is all-important therefore that greater attention should be given to its early recognition.

2. Females are far more frequently affected than text-books would lead one to imagine.

3. Gastric cancer is not so much a disease of middle age as one would be led to believe, a marked percentage of cases occurring under 40. The prevalence of the belief that it is a disease of middle age has often led to disastrous results in the diagnosis of the disease under 40.

4. Heredity, in some cases, plays an important *rôle* in etiology. When present, it is usually markedly so.

5. All cases of gastric ulcer, healed or unhealed, are potential carcinomata.

Alcohol, by acting as an irritant, may cause ulceration and, later, carcinoma, or it may cause carcinoma directly. Oral sepsis and carious teeth probably are important factors also.

6. " Pyloric " carcinomata are more common than "gastric." As a rule the former give more definite signs. They should accordingly be more easily·diagnosed, and as they lend themselves more readily to excision, operative results should be brighter.

7. Gastric disturbance in a person of over 45 should always arouse suspicion and be considered seriously. Unless definite improvement occurs in 3 or 4 weeks under medical treatment, such cases should be dealt with surgically.

8. Systematic weighing in all gastric cases should be more commonly practised, carcinoma being marked by a steady decrease in body-weight.

9. Anæmia being marked in most cases only towards the close, blood examination is probably useless as a help to early diagnosis.

10. Like anæmia, subnormal temperature also is probably a late occurrence.

11. Constipation is a marked feature in practically every case of carcinoma of the stomach. But its occurrence is so common, even in health, that it must only be awarded secondary consideration.

12. Anorexia as a symptom is of the greatest importance— especially if occurring in a person over 45 previously healthy—all the more so if it be accompanied by a feeling of load or weight in the epigastrium after food, by eructations, water-brash, and heartburn.

13. Vomiting and hæmorrhage as symptoms are too often late occurrences to be of value in diagnosis in the early stages.

14. Pain is an almost invariable early symptom.

15. Examination of test-meals should be more commonly performed. On the results obtained, however, *reliance* can be placed only in the late stages. In the early stages they *may support* a doubtful diagnosis.

16. Careful abdominal examination is essential. It must be leisurely performed and frequently repeated.

17. The presence of a tumour above the umbilicus should be a signal for immediate action, provided the bowels have been cleared out, and a splenic or hepatic origin excluded.

18. Scientific tests should be more generally resorted to. The disease, however, first comes under the notice of the ordinary practitioner, who, in many cases, unfortunately lacks both the time and the facilities for the necessary investigations. In most cases scientific tests are applied and results drawn therefrom only when the disease is *clinically* almost unmistakable.

19. Cases in the past have been sent to the surgeon much too late —a fact clearly brought out by the relatively small number in which a radical operation was possible.

20. The only cure at present is a surgical one, and the mere prolongation of life is possible only through surgical intervention.

21. All cases of doubtful gastric disorder, therefore, should be submitted to a careful examination, first without, and later (if necessary) under a general anæsthetic. This applies both to chronic cases and to cases occurring in persons over 45 with a previously clean gastric history.

If, thereafter, doubt exists, the situation being clearly and definitely described to the patient and his friends, a surgeon should be consulted. With the surgeon eventually must the issue lie. Only by the collaboration of physician and surgeon will an early diagnosis be arrived at, and a consequent radical treatment be rendered possible.

In conclusion, I take this opportunity of thanking Professor Caird for his kindness in giving me permission to make use of his case-books.

CLINICAL RECORD.

A CASE OF ACUTE TOXIC POLYNEURITIS.

By ROBERT A. FLEMING, M.D., F.R.C.P.

J. C., æt. 24, a sailor, was admitted to Ward 31, Royal Infirmary, on the 15th November 1912 with almost total loss of power in both legs, and great weakness of hands and forearms. The paralysis dates from 6th August 1912.

Ten weeks before the onset of the paralysis, the patient, who was a sailor on board a steamer bound for Rio de Janeiro, was employed along with other men for fourteen days in painting the hold of the vessel with naphtha paint. He painted for about 4 hours a day. At the time he was in perfect health, and no one engaged in the same work was similarly affected to the patient. The ship's cargo was coal.

On the evening of the 6th August, when in Rio harbour, patient

was sitting in the galley, with his right leg crossed over the left, when he felt the calf of the left leg numb and tingling. He walked about, but the numbness did not pass off. Next day the right leg became affected, and walking began to cause pain and a sensation of tightness. He gradually got worse, and at the end of a fortnight could not walk at all. Two weeks after the legs were paralysed the left thumb and left finger-tips became numb, and the following day the right hand was also similarly affected.

The patient was taken to Brooklyn Long Island Cottage Hospital, where he remained for 9 weeks, and was then brought home to Edinburgh.

The present condition of the patient corresponds to a typical case of peripheral neuritis so far as the legs and arms are concerned. The muscles are wasted, there is marked foot-drop and slightly less definite wrist-drop, and extreme muscular and nerve hyperæsthesia. Touch and pain sensations are greatly delayed. The tendon responses are absent in the legs and just decernible in the arms. There are no cramp-like pains. The only remark the patient makes as to subjective symptoms is the complaint that his legs feel "extremely cold." There is also some blunting of temperature and tactile sensation over both arms and legs.

There is almost complete loss of movement at the ankle-joints, and the extensors are particularly weak at the knee-joints. The hip-joint movements are fairly good. All the muscles of the hands are extremely weak. The movements at the elbow-joints are much restricted, while the shoulder movements are fairly good.

The electrical reactions demonstrate complete reaction of degeneration in the lower leg muscles, and partial reaction of degeneration in the lower arm muscles.

There is little or no tremor. The muscles of the trunk and head are normal. There is no inco-ordination. There is marked sweating of the legs and arms. The mental condition of the patient is unaffected, his memory is excellent, and he can supply facts and dates with perfect accuracy.

The patient is a total abstainer as regards alcohol, and although it is difficult to assign a date for the febrile attack, which as a rule precedes cases of acute toxic polyneuritis, by a process of exclusion, there does not appear to be any other probable or possible explanation. All the usual and also unusual causes of peripheral neuritis have been investigated. The remarkable escape of intellect and memory from any involvement certainly makes one less certain as to the correctness of the diagnosis, although the writer has seen another case almost exactly similar.

Under treatment with strychnine hypodermically, massage, and the use of splints to correct the foot-drop, great improvement has already resulted since the patient was exhibited at the clinical meeting of the Medico-Chirurgical Society on 18th December 1912.

TRANSACTIONS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held on 15th January 1913, Mr. J. M. Cotterill, President, in the chair.

Drs. Charles M'Neil and J. P. M'Gowan communicated a paper on "*Endemic Febrile Illness, with Rapidly Fatal Cases, in a Boys' Industrial School near Edinburgh*," which appears on p. 201.

In the discussion which followed Dr. J. L. Green said he had seen and treated several of the cases at the institution referred to in the paper. The illness was a remarkable one. The most healthy boys seemed to be the ones most commonly affected. The temperature was an almost certain guide to the prognosis. Whenever it exceeded 102 F. the case proved fatal. The disease was not only deadly to its victims, but was most terrifying to the other boys.

Dr. R. J. Johnstone said that he was a manager of the school. Everything in the way of ventilation, food, and clothing had been looked into. At one time all the boys had been camped out in tents. The epidemic had been arrested for five and a half months, and then one case had occurred.

Mr. Wade said he had seen some of the cases which were undoubtedly pneumococcal septicæmia. He thought that a factor in the etiology was the change in the environment of the boys when they were transferred from a life of a primitive kind to one involving work and discipline.

Professor Littlejohn said it could not be supposed that lymphatism was the cause of death in these cases, but that condition made a fatal result more likely to occur. He held that in infancy status lymphaticus might actually produce death. The thymus pressed on important organs and might cause cyanosis. He had seen a case post-mortem in which the thymus completely obscured the heart. The robustness of cases of status lymphaticus was more apparent than real.

Dr. Shennan said that he and other members of the pathological staff at the Royal Infirmary had made post-mortem examinations on several of these cases. In some of them pneumococci were found, and this was the only cause of death which could be assigned, although the explanation was not altogether satisfactory. Negative results were obtained in at least two cases favourably placed for procuring cultures of the pneumococcus. In several cases no enlarged thymus or hypertrophied lymphatic tissue had been noted, and this was an additional and valuable contribution of the authors to the possible pathology of these cases. The pneumonia present in several cases did not seem sufficient to cause death, and he would prefer to call the cases pneumococcal poisoning. Many difficulties arose in connection with status lymphaticus. Why was this school specially affected? Cases of death occurring after injection of diphtheria antitoxin had been attributed to lymphatism, but that raised the question of anaphylaxis. He asked if cyanosis were a sign of lymphatism.

Dr. Goodall said he had had a most alarming experience which he thought answered Dr. Shennan's question. He had on one occasion been amusing a child of four in a hospital ward. The game became rather noisy, and he had laid the child on his back in his cot and drawn the coverlet over his face and walked off. As the child did not respond with the volley of impudence

he expected he turned and found the child had not moved. On with-drawing the sheet the boy was seen to be cyanosed and not breathing. Fortunately he had almost immediately given a gasp and normal breathing returned. This was a lesson not to take any liberties with children who might be suspected to be subjects of lymphatism. He was rather surprised to hear that children suffering from this condition looked robust. In cases in which he had suspected the condition the child always presented an appearance which might be described as "pasty." He had been asked to examine a few such children before proposed operation, generally for tonsils and adenoids. There was slight anæmia, leucopenia with high lymphocyte percentage, and he advised that such cases should be left alone. There were, of course, very many cases of enlarged tonsils and adenoids without lymphatism. He was inclined to think that all the symptoms described by the authors of the paper might be attributed to pneumococcal septicæmia. The existence of the lymphoid changes in cases of fulminating scarlet fever and diphtheria seemed to vitiate the authors' argument and might simply be a response to toxæmia at an age when lymphatic hyperplasia was common and easily induced.

Mr. John Fraser read a paper on "*Bone Tuberculosis*," which appeared in the *Journal* (1912, vol. ii. p. 436).

Mr. Stiles said that the paper confirmed his opinion that the pathology of bone tubercle depended on the distribution of the bacillus. Mr. Fraser had found it easy to infect joints experimentally and difficult to infect bone. In children, however, bone was easily infected. The reason was that they were suffering from toxæmia from another tuberculous focus—usually in glands of the neck, thorax, or abdomen. This toxæmia set up an endarteritis, and the resistance of the marrow was impaired and tubercle of bone followed. Tubercle very rarely began in the epiphysis, and when it occurred there it was secondary to a joint lesion, either through necrosed cartilage or from the synovial membrane. Tubercle of the diaphysis was often primary, and the disease might pass to the joint or might be secondary, the joint lesion reaching the diaphysis through the synovial membrane if the epiphysis were short. There were primary lesions which began in the epiphyses without joint lesion. It was important to treat these before the joint became affected. If the X-rays showed a circumscribed lesion, conservative treatment might be employed : if a diffuse lesion, it should be cut down upon. The great importance of Fraser's work was that it established the fact of the frequency of bone and joint tuberculosis of bovine origin. These were cases of milk infection, and by his declaration that the human subject was not liable to bovine tuberculosis, the discoverer of the tubercle bacillus had done more than anyone else to spread tuberculosis.

A MEETING was held on 5th February, Mr. J. M. Cotterill, President, in the chair.

Dr. Edwin Bramwell showed a woman suffering from *symmetrical paralysis and wasting of the intrinsic muscles of the hands*. She was 33 years of age, and had probably suffered from congenital syphilis. The condition of the hands had first been noticed at the age of 1 year. Sensation was unimpaired. There was a strong probability that the case was one of congenital absence of the muscles.

Dr. Archibald M'Kendrick read a paper on "*The Position of the Radiographer in Relation to the Physician and Surgeon*." He referred to the status of the radio-

grapher in continental and English hospitals. The radiographer should be entitled to publish his radiographs. He should be able to produce a good photograph, and to assist his colleagues in their interpretation. In the latter respect he required a knowledge far beyond that of the mere photographer, and should be regarded as a consultant just as the pathologist or ophthalmologist might be.

The President remarked that the question was difficult, and thought that the profession was not yet in a position to deal with it. The problem would probably answer itself in time. Mr. Wallace asked what good the photograph was to the man who had not seen the patient. It was of great value to the surgeon in charge of the patient. Some of the very best plates were taken by men who had no medical training, and he did not care who had taken the photograph as long as it was a good one. Dr. Chalmers Watson said that the main consideration was a good photograph. Mr. Struthers said that some radiographers professed very wide powers of diagnosis, but after all they only saw one aspect of a case, and they could hardly be experts in the various branches in which they were called upon to assist.

Mr. John Fraser gave a lantern demonstration on *Joint Tuberculosis*. He referred to the conclusion reached in his previous communication (*Edinburgh Medical Journal*, 1912, vol. ii. p. 436), that bone and joint tuberculosis was a blood infection commonly of the bovine type. He referred to the anatomical arrangement of joints, and showed the position of the circus vasculosus and the metaphyseal vessels and their influence in determining the starting-point of the lesions. The pathological changes in the synovial membrane was in the first place a thickening of the endothelial lining and a deposit of fibrin. Further developments might be in four directions—(1) Tubercles scattered all over the membrane. In this type caseation occurred early. (2) Multiple but localised tubercles surrounded by fibrous tissue. (3) Tubercles associated with active growth of granulation tissue. (4) The whole synovial membrane becomes converted into fibrous tissue. There was always endarteritis. The lesion affecting the cartilage might be perichondral or subchondral. In the former the cells became myxomatous, and the matrix became fibrous. The cartilage then tended to be rubbed off. In the subchondral cases the disease penetrated between the articular cartilage and the bone, and the cartilage might be thrown off in flakes or lifted off like a cap. In bone the marrow became fibrous and the bone became rarefied.

The treatment of early bone tuberculosis was essentially conservative. A light splint that could be moulded to fit the joint and was easily removable for purposes of massage was the best. He had found celluloid splints very useful. A cheap substitute could be made by a mixture of gum, gelatine, and potassium bichromate. He had found benefit follow the use of an autogenous vaccine. A piece of fresh tuberculous tissue was ground up with sand, the emulsion of bacilli was standardised, and its value seemed to lie in the fact that it contained in addition to the toxins the principle which determined the curative overgrowth of fibrous tissue.

Professor Caird said that the paper was enlightening and helpful. The author had done much to disentangle the different pathological processes. He had been specially struck by the explanation of the incidence of the disease by the position of the vascular zone and by the resemblance of the changes in the vessels to those seen in syphilis.

Mr. Stiles said he had been engaged for twelve years in the treatment of tuberculous bones and joints. The question was a very wide one—not a mere question for the specialist or orthopædist. Mr. Fraser had spoken of the early and chronic cases. In Scotland there were only three institutions where such cases in children could be treated. They tended to be elbowed out of the large hospitals by abdominal and other cases. In advanced cases such as they saw in Scotland he had been accused of doing radical operations when conservative measures might succeed. But in cases, say, where the head of the femur had been destroyed, where there might be an abscess in the thigh or in the pelvis, it was of no use to keep on waiting in hospital, nor was it any use to send such cases home. Mere opening abscesses and scraping did more harm than good. A thorough attempt to remove all the diseased tissue should be made. It was extraordinary how such cases improved after operation. They were freed from a chronic toxæmia. He did not mind how advanced the tuberculous process might be if there were no mixed infection. The result depended on the extent of the disease and the extent of operation, but to a greater extent on the after-treatment. In this respect they were under a great disadvantage. Patients had to be sent away from hospital, and often from any near skilled advice. The best plan under the circumstances was to put up the joint in a plaster of Paris splint. What was wanted was a country open-air hospital for these cases. If a fair proportion of the money that had been spent on sanatoria had been directed towards the eradication of bovine tuberculosis the disease would have been now much less. Bovine tuberculosis was eradicable.

Dr. James Miller said that the large proportion of bovine tuberculosis was not the experience of other places, but it was certainly commonest in Edinburgh. Obliterative endarteritis was not peculiar to bone tubercle. It occurred in the lung, and had the effect of diminishing the tendency to hæmorrhage. He had seen endarteritis in the neighbourhood of the affected part, away from the actual lesion.

Mr. Dowden said that he was convinced of the bovine origin of tubercle in children, but it was rather remarkable that bone tuberculosis was common in China and Labrador although milk was not drunk. Gland tubercle was, however, rare. He remarked upon a very virulent type of tubercle which was seen in old persons. There was now a great diminution in the number of cases operated upon for excision of tuberculous joints. This was probably due to the greater tendency to conservative treatment.

Dr. M'Kendrick said that in X-ray photographs one frequently saw an excess of bone at the point of entry of the nutrient artery. The same sort of change was seen in rheumatoid arthritis. He was indebted to Mr. Fraser for pointing out these changes which blurred the outlines of the bones. He had often had photographs sent back because the outlines were not well shown, and it was clear that this was not the fault of the picture but of the bone.

Dr. Chalmers Watson was interested in the resemblance between tuberculosis of joints and rheumatoid arthritis. He had long held that in the latter condition there was a vascular affection due to toxæmia.

Dr. Cowan Guthrie referred to the importance of environment in the incidence of tuberculosis.

The President remarked on the difficulty of carrying out proper treatment of bone and joint tubercle in general hospitals. Cases were turned away by the dozen, and other cases admitted had to be turned out in three or four

weeks to return to conditions which did not favour recovery. There was urgent need of country homes for surgical tuberculosis where the patients could have medical supervision as well as fresh air and good food.

Forfarshire Medical Association.

A MEETING of this Association was held in the Conjoint School of Medicine, Dundee, on 13th February, Dr. R. C. Buist in the chair.

Dr. Foggie showed (1) a case of *favus*, untreated and of two years' duration, in a child of 4, and (2) a case of *molluscum contagiosum* in a boy of 14 years.

Professor Kynoch demonstrated the following specimens :—(1) A pregnant uterus at full time with *concealed accidental hæmorrhage*. On admission to hospital the patient, aet. 43, and 11-para, was pulseless, and died while hurried preparations were being made for Cæsarean section. (2) *A thin-walled ovarian cyst*. Seven years previously a right ovarian tumour had been removed by Professor Kynoch. During the interval between operations menstruation had been regular and slightly excessive. The left ovary was now completely cystic and no Graafian follicles were demonstrable macroscopically. (3) *Fibroma of ovary* undergoing calcification. This was coincident with malignant disease of the omentum, the latter being the cause of the pain which the patient suffered.

Mr. Price showed a specimen of *sarcoma of the liver* from an infant of seven months. About five weeks before death there was noted some distension of the abdomen, and three weeks later the abdominal parietes were seen to be exceedingly thin, while there was dulness, more marked in the right side than in the left, in the upper half of the abdomen. The lower margin of the liver could not be felt. There was ascites. Exploratory cœliotomy was performed, and a large liver with smooth surface was noted. Pathological report was small round-celled sarcoma of liver, with numerous hæmorrhages and almost complete replacement of liver tissue. Mr. Price read a paper entitled " *Notes on Some Cases of Facial Neuralgia Treated by Injections of Alcohol.*" The cases numbered six. The technique recommended was the "hitting" of the second and third divisions and the supra-orbital branch of the first with the point of the hypodermic needle and the injection into the surrounding tissue of 1½ to 2 c.c. of 80 per cent. alcohol. The patient's sensation of pain indicated when the nerve was touched, and each division or branch was "hit" as it made exit through its foramen. Of the six cases five were successful, the first alone being a failure, and in this the absence of anæsthesia probably indicated the missing of the nerve. The patient refused to have a repetition. In one case a second injection was required, but the others reported themselves as free from pain. Mr. Price preferred to employ this method rather than resort to operations on the Gasserian ganglion. If injections failed, then an operation on the ganglion might be justifiable.

Dr. Foggie read "*Notes on Two Cases of Acquired Dextrocardia.*" The first was a girl of 17 who had had bronchitis from the age of 5. The heart extended to the right nipple line. An X-ray photograph was shown. The second was that of a man of 26, with consolidation of the right lung and extensive suppuration. Pneumothorax was present at a later stage. There was transposed præcordia on the right side.

Mr. Don described a case of *acute pancreatitis*, at present undergoing treatment. She was admitted to hospital with the diagnosis of appendicitis. The

previous day she had taken ill and had very severe pain all over the abdomen. There had been similar attacks during the previous seven months, and the complaint was of pain a little above the umbilicus, then throughout the abdomen and up to the shoulders. There was no jaundice, but the stools were sometimes clay-coloured. At the operation the appendix was found to be normal. About a pint of brownish-green fluid escaped from the subhepatic omentum. Plaques of fat necrosis were discovered in the omentum. A fistula passed into the pancreas. Duodenum was normal. Gall-bladder contained a few calculi. Mr. Don regarded the case as one of inflammation of the pancreas with rupture of the duct.

Dr. Pirie showed a series of radiograms from a case of resection of bone, in which the regeneration of bone was to be seen. Sir William MacEwen's views as to new formation of bone were referred to. Mr. Price added a few observations on the case which had been under his care.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., AND JOHN D. COMRIE, M.D.

BILHARZIAL DISEASE.

THE lesions of bilharzial disease (*Glasg. Med. Journ.*, January 1913) are described by Professor Ferguson of Cairo, and as the result of extensive observation and experiment several interesting new points are brought out. The disease has been indigenous in the Nile valley from the very earliest times, and from Egypt has probably been carried by infected persons to other parts of the world where it has appeared in more recent years. By a method of digesting pieces of tissue from the bladder, bowel, etc., in 3 per cent. caustic potash solution at 60° to 80° C. and examining the sediment under the microscope the writer found the disease present in 61 per cent. of all males brought to post-mortem examination in Cairo. Further, the ova can be demonstrated in many parts of the body where their presence has not hitherto been suspected, viz., the ovary, lungs, brain, and spinal cord. When ova are set free in the urine or faeces the resulting miracidium dies quickly unless it can escape into fresh water. Even in ponds and pools the miracidia live only for thirty-six hours, so that a volume of water becomes again harmless within forty hours of infection. Infection probably takes place through the nasal and perhaps through the genital mucosa. With regard to the position of the spine on the ova both lateral and terminal spines may be found in the bladder and rectum and even upon ova in the oviduct of one worm, so that this character of the ovum depends neither on its species nor on the organ affected.

AMBARD'S CONSTANT IN RENAL DISEASE.

A comparison of two tests for functional efficiency of the kidneys is given by Pierret, Arnould, and Benoit (*L'Echo Médicale*, 19th January 1913). The two methods compared are what is known as the "Constant of Ambard" and the methylene blue injection test. The Constant of Ambard depends upon the axioms which he propounds :— (1) The concentration of the urine as to urea remaining constant, when the amount of the urea of the blood increases by a certain value the quantity of urea eliminated in 24 hours by the urine is multiplied by the square of this value. (2) If the concentration of the urea in the blood remains constant the urinary outflow is inversely proportional to the square root of the concentration of the urea in the urine. (3) Therefore the output of urea varies directly with the concentration of the urea in the blood and inversely with the square root of the urea in the urine. He thus gets the formula

$$\frac{U}{\sqrt{D}\sqrt{c}} = \text{constant factor}$$

(where U is the concentration of the blood in urea per litre, D the output of urea in twenty-four hours, and c the concentration of the urine in urea per litre). If this be expressed in terms of an average body-weight of 70 kilos and a normal urinary concentration of 25 grms. per litre, then

$$\frac{U}{\sqrt{D \times \frac{70}{P}} \times \sqrt{\frac{c}{25}}} = \text{constant factor.}$$

This constant factor normally works out between 0·06 and 0·07 (P is the weight in kilos of the person under examination). If the value rises appreciably it indicates retention of urea and azotæmia ; if it falls markedly it means an increased permeability of the kidney. The method has the advantage of enabling the physician to determine on the spot the functional power of the kidney, but it has the drawback of requiring the withdrawal of a quantity of blood by means of an aspiration syringe in order to estimate U. In one instance where Ambard's Constant had risen to 0·3 in place of 0·07 or thereabout the methylene blue test was found to be greatly prolonged—2½ hours before the colour appeared in the urine and 5 days before it vanished. Similarly in other cases a close parallelism was found between the two methods while in cases that came to autopsy the kidneys were found diseased when the factor was much raised.

In another article upon this subject by Carrion and Guillaumie (*Bull. et Mém. de la soc. de méd. de Paris*, 28th December 1912) a test of Ambard's method upon three abnormal cases is described. It is

obvious that if the method is to be reliable the first essential is that in one and the same person the constant factor of functional efficiency arrived at by the method must always be the same, no matter what changes of diet, etc., may be made. These writers estimated the constant for each of three patients both before and at intervals after the administration of 20 grms. of urea in milk. Notwithstanding the fact that the figures for the calculation varied greatly each individual maintained his constant practically unchanged. These writers also give a rule for determining the amount of damage to the power of the kidneys from the factor obtained, which is that the functioning value is inversely proportional to the square of the constant. Thus suppose a case shows a constant factor of 0·09, then the normal being about 0·07,

$$\left(\frac{1}{\cdot 09}\right) : \left(\frac{1}{\cdot 07}\right)^2 \; :: \; 100 : 60.$$

That is to say, the individual in question has a renal function of 60 per cent., or has lost 40 per cent. of his normal power.

Enterotoxic Neuritis.

Polyneuritis of enterotoxic origin is discussed as a new symptom-complex by C. von Noorden (*Berl. klin. Woch.*, 13th January 1913). There is a group of patients who complain of some irregularity of digestion. Generally there is constipation, or at all events, if the bowels move daily, there is nevertheless a large and constant residue in the sigmoid flexure, giving to sensitive people a sense of permanent fulness of the abdomen, and producing on the left side a point of maximum tenderness similar to the M'Burney point of appendicitis on the right side. Very often the trouble is referred to the stomach, and there is found to be a difficulty in emptying of this organ, together with hyperacidity. Pains in various parts of the body next appear, for example in the region of the occipital nerve, or of the trigeminal, or in the arms, or along the sciatic nerve, and a specially common nerve to be affected is the radial. The neuritis is always of a sensory type, and the pains appear especially in the morning and wear off as the day advances. There is frequently also some interference with the action of the heart in the way of slowing or irregularity of the pulse. A noticeable feature is the reduction in quantity of the urine, with the deposition of a copious sediment, while the connection with intestinal intoxication is demonstrated by the great rise of indican that is excreted. This may be two, three, or four times the normal quantity, and the indol may be combined in part with glycuronic acid, which causes the urine to give a slight reduction of Fehling's solution though no sugar is present. Dr. Eppinger has been able in some of these cases to extract from the faeces a substance which injected into animals produces similar effects, and which on contact with the human skin will produce an urticaria lasting 10 or 15 minutes. This appears to be

produced by a bacterium of the paratyphoid group. Another very important symptom is the presence of moderate increases in the variation between the temperature maxima and minima each day, leading often to a diagnosis of early tuberculosis when young people are affected. Other common and erroneous diagnoses of this condition are rheumatism, gout, neuralgia, arthritis, and uric acid diathesis, but the symptoms all disappear so soon as ever the intestine is brought into order.

With regard to treatment no uniform rule can be prescribed, but each case must be studied by itself. Sometimes a diet of milk alone, sometimes buttermilk or yogurth, kefir, etc., is most suitable; in other cases a few days upon sugar-water and nothing else is very beneficial; and some cases do best upon animal diet. Generally it is best to avoid aperients and other drugs, and as a rule two or three weeks suffice to find out and establish a suitable diet for the patient's cure.

ARTIFICIAL PNEUMOTHORAX IN PHTHISIS.

A summary of the clinical results in Forlanini's method of healing pulmonary tuberculosis by artificial pneumothorax is given by Kéry and Le Bourdellès (*Gaz. des Hôp.*, 7th January 1913). They divide the results into those which are immediate and those more remote. The former are in proportion to the degree of compression of the lung that can be obtained. The expectoration of persons with cavities is at first increased, being doubled or trebled for two or three days after each injection, but when the lung is markedly compressed it later diminishes and disappears altogether, together with the bacillus. The fever, night sweats, and digestive troubles are all favourably influenced, and the liability to haemorrhage is supposed to be lessened. It might be thought that dyspnoea would ensue, but this is not the case, and indeed patients upon whom the procedure has been carried out appear actually to be relieved. This is in accordance with the experiments of Bernard, Le Play, and Mantoux, who have shown that animals possess such a superabundance of pulmonary tissue that a reduction of the lung surface to one-sixth of the normal is quite compatible with life. With regard to the duration of the treatment the writers recommend, as a general rule, two years of compression of the lung, after which decompression is effected and the function of the lung is restored, as can be made out by the stethoscope. With regard to permanent results the treatment is so new that there are few statistics to be had. Sangman and Hauser report 33 cases of more than eight months' duration under treatment; of these, 9 cases had to be stopped because the cure was interrupted by adhesions, or because a bilateral condition was present; of the remaining 24, eight quitted hospital greatly improved, and one was decompressed and regarded as cured.

J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

TUMOURS OF THE BLADDER.

AN interesting discussion of this subject took place in the urological section of the American Medical Association at the sixty-third annual session in June 1912.

In discussing the pathology of vesical neoplasms Judd (*Journ. Amer. Med. Assoc.*, 16th November 1912, p. 1788) mentioned that out of 114 cases met with in the Mayo clinic only two could be classified as benign, both being fibromyomata. Under the heading of malignant disease he grouped all cases of papilloma as well as those of carcinoma. Papillomatous tumours are frequently multiple, there being usually one large and several small tumours, and the former is apt to overshadow the latter, one or more of which may easily escape notice. Papillomata seldom recur locally, but frequently in some other part of the viscus. Cells brushed off in removing the tumour are prone to engraft themselves on any tissue with which they come in contact, hence the frequency of recurrence. Estimated from the clinical standpoint all papillomata are malignant, though one type of papillary tumour may be histologically malignant at the onset, while another type may at first show no evidence of invasion of the surrounding tissues. All types of papilloma have the power to recur and also to destroy life, in the same manner as the recognised malignant tumours. In all probability if the patients lived long enough all papillomata would become histologically malignant. A large percentage of bladder tumours occur close to the base of the viscus, at or near the ureteral or urethral orifices, hence the difficulty of their complete removal. Carcinoma, according to O'Neil (*ibid.*, p. 1786), occurs either as a primary sessile growth originating in the mucous membrane and infiltrating from the start, or as the degeneration of the base of a more or less pedunculated papilloma. Microscopically, primary carcinoma is seen to be made up of solid atypical masses of epithelial cells infiltrating the bladder wall ; occasionally, however, a malignant adenoma is found, and, as there are no glands in the vesical mucosa, this unusual form of tumour must arise from aberrant urethral or prostatic glands, or from a foetal inclusion of rectal mucous membrane. Three or four cases of the latter type have been described, the growth in each instance corresponding microscopically to columnar-celled adenocarcinoma of the rectum. The spread of malignant tumours of the bladder is usually by direct extension and infiltration, for although the disease spreads along lymphatic channels it does so slowly, and the disease may be far advanced locally before the iliac and lumbar glands are involved.

Remote metastases are rarely seen. The large number of these cases, giving a long history of painless hæmaturia, emphasises the importance of making a cystoscopic examination in all cases of symptomless hæmaturia. Where carcinoma is diagnosed a bimanual vaginal or rectal examination should always be carried out, as thereby valuable information may be obtained as to the degree of infiltration, and thus as to the operability of the case. Regarding the treatment of papillary tumours of the bladder, Beer (*ibid.* p. 1784) strongly advocated treatment with the high-frequency current for those cases in which micro scopic examination of a portion of the tumour showed it to be still of a simple non-infiltrating character. This method of treatment is now widely used by American surgeons, and the reports which Beer received in answer to inquiry from various clinics were for the most part enthusiastically favourable to the new method. Papillomatous growths necrose and completely disappear under this form of electrotherapy. The method as originally described by Beer (*ibid.*, 28th May 1910, p. 1768) consists in filling the bladder with distilled water, passing in a Nitze double-catheter cystoscope, and through one of the catheter tunnels introducing the electrode, which consists of a six-ply cable of copper wire insulated with rubber except at its free end. Through this electrode is passed the Oudin current derived from a Wappler machine. The other catheter tunnel is fitted with a rubber tube, and is used for irrigation. Under the guidance of the eye the application is made directly to the growth, the electrode being pushed a short distance in among the villi. Several applications of from 15 to 30 seconds each are made to different parts of the tumour. When the current is applied it is seen that the part of the growth in contact with the electrode becomes black and charred, the whilst neighbouring parts are blanched, and gas bubbles are freely generated. After such an application portions of necrotic tumour are regularly passed with the urine. Usually by the end of the fourth or fifth sitting the whole tumour is seen to have necrosed off, and to have left a clean base to which it is advisable to have one further application. The normal bladder wall shows little or no sign of irritation even after repeated applications. Though considerable heat is generated in the electrode this will not explain the complete disappearance of the growth in these cases, and Beer considers that this is probably due to the action of electrolytes In a further communication on the subject Beer (*Ann. of Surg.*, 1911, vol. liv. p. 208) gave full records of five cases of papillary tumours of the bladder which he had treated successfully with the high-frequency current. In the latter paper a complete and detailed description of the method will be found In Vienna, Bachrach (*Wien. med. Woch.*, 31st November 1912) has adopted Beer's method of treatment of bladder tumours, and from an experience of 15 cases he is convinced that the tendency of papillomatous tumours to recur is most

effectually met by the searching influence of the high-frequency current, which, relatively speaking, is a radical cure for this type of growth. This method has been used in the Mayo clinic also in 18 cases, with the most gratifying results. This number included 11 cases of recurrence after operation. Five of these patients were examined one year after high-frequency treatment, and in none of them was there any evidence of return of the growth Villous growths on small pedicles were found to be the most favourable type for treatment. Beer considered that treatment by the Oudin current was indicated in the case of all so-called simple papillomata, even though large or multiple, but that definitely malignant growths were not amenable to its influence. The operative treatment of vesical neoplasms should vary according to whether the tumour is villous and pedunculated or is sessile and infiltrating. For the former class the supra-pubic extra-peritoneal removal is that usually practised, and in this operation Judd recommends that the tumour should either be excised with the cautery or that the cut edges remaining after the tumour has been removed should be thoroughly cauterised. For the sessile type of tumour the trans-peritoneal operation is undoubtedly the best. By this route the bladder may be freely opened, and as the majority of these growths occur at or near its base the best access is thus obtained. If the ureteric orifice be involved the ureter can be readily reimplanted, and the entire thickness of the bladder wall may be resected without handling the growth. Moreover, the operative mortality is low ; in the Mayo clinic 30 patients have been operated on by this method with a mortality of 3. In 9 of these cases it was necessary to transplant one ureter into another quadrant of the bladder, whilst the prostate was found to be involved and was removed in two of the cases. O'Neil strongly recommended extra-peritoneal supra-pubic drainage after the trans-peritoneal operation. Infection, which is particularly undesirable in these malignant cases, is much less liable to occur by this method than when urethral drainage is used. Drainage of the peritoneal cavity is unnecessary and undesirable.

Judd furnished some interesting statistics regarding the prognosis in cases of vesical tumour. Out of 38 patients who either suffered from inoperable tumour or who refused operation a complete history of the disease from the first symptom till the fatal issue was obtained in 20, and the average duration of the disease until death ensued was found to be 26 months. In the patients operated on by the trans-peritoneal route the average duration of life from the beginning of symptoms until death or until the time of writing was 41·5 months. In the 33 cases in which the extra-peritoneal supra-pubic operation was performed the average duration of life from the beginning of symptoms until death or until the time of writing was 40 months. Four patients operated on by the trans-peritoneal route underwent

second operations for recurrence, and three of the 33 supra-pubic cases were also treated for recurrence.

In view of the great tendency to recurrence and the possibility of considerable progress in the growth before the appearance of symptoms Judd strongly recommends that these cases be examined by the aid of the cystoscope every three to six months after operation for at least two years. In this way recurrences may be discovered early, at which stage they are particularly amenable to high-frequency treatment.

PANCREATIC LYMPHANGITIS.

Under this heading Deaver (*Journ. Amer. Med. Assoc.*, 4th January 1913) brings forward evidence in support of the view that both chronic and acute pancreatitis may be due in many cases to an infection reaching the pancreas by way of the lymphatics. Pfeiffer and Deaver (*Amer. Journ Med. Sci.*, 1912, p. 143) have pointed out that the pancreas, by reason of its retro-peritoneal situation, bears a close relation to the thoracic duct and to many trunks which empty into it from the visceral lymphatics. The frequent association of chronic pancreatitis with gall-stone disease is well recognised, and it has generally been inferred that the pancreatic mischief results from infection travelling backwards along its ducts. Were this the case, however, the involvement of the pancreas would follow the distribution of the ducts and not remain localised in the head of the pancreas, as it usually does in gall-stone cases. It is noteworthy, also, that pancreatitis is more common in males, whereas gall-bladder disease is more common in females, and moreover that the pancreas is frequently diseased without there being demonstrable disease of the biliary tract. From a statistical analysis Deaver found that 36 per cent. of all cases of chronic pancreatitis and 25 per cent. of those of acute pancreatitis were not accompanied by disease of the biliary apparatus. Franks has shown that the lymphatics from the gall-bladder run immediately over the surface of the pancreas and then anastomose with the lymphatics of that organ ; a similar anastomosis exists with the lymphatics of the duodenum. In many inflammatory conditions of the abdomen, *e.g.*, appendicitis, there is a retro-peritoneal lymphangitis fraught with the possibilities of injury to the pancreas, which lies almost directly in the lymphatic path. The lymphatics of the pancreas do not, as in certain other organs, emerge at a hilum, but leave the gland at various points along its surface and join the neighbouring trunks or plexuses. In many cases the lymphatic infection must needs involve a retrograde flow in order to gain access to the organ. This form of infection, however, is a well recognised occurrence in other portions of the body. The diagnosis of chronic pancreatitis is still a matter of great difficulty, as the disease presents few if any physical signs, and we still lack any means of determining the presence of slight functional derangements of the organ. Its

diagnosis is the more difficult in that it is so frequently associated with other abdominal lesions. Its presence, however, should be suspected in cases presenting a somewhat indefinite cycle of upper abdominal symptoms, chief among which are loss of appetite, vomiting, and emaciation.

As pancreatic lymphangitis is usually secondary to disease in some other organ its treatment must essentially consist in measures directed to the cure of the primary focus of disease. Thus whilst in one case the removal of a chronically diseased appendix may be indicated, in another, appropriate treatment for gastro-duodenal catarrh or duodenal ulceration may be called for. As, however, clinical experience has shown that the majority of cases of early pancreatic inflammation are closely related to disease of the biliary tract, drainage of that tract is the sheet-anchor of our treatment of chronic pancreatic disease. In cases of pancreatitis associated with jaundice the latter is usually accounted for by pressure of the pancreatic tissue on the common duct where it courses through the head of the pancreas. Deaver, however, believes that in many of these cases there is an associated spasm of the sphincter of the papilla of Vater such as is seen at other sphincter-guarded orifices, and that improvement will follow measures, such as dilatation, which will at least temporarily destroy the sphincteric function.   D. P. D. W.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF
A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

PLACENTA PRÆVIA.

CAN we improve upon our results in the treatment of central placenta prævia? Dr. Francesco Valtorta thinks we can. He has been working under Professor Mangiagalli in the Obstetric Institute of Milan, and has been analysing the cases of placenta prævia which occurred there between January 1890 and June 1912 (*Ann. di Ostetricia*, ann. xxxiv. vol. ii. pp. 362-368, 1912). There were 12,591 confinements in these years, 245 of which were complicated with placenta prævia, and of these, 100 were instances of the central or total variety : the maternal death-rate for the 245 was 12·28 per cent. and the fœtal 53·7 per cent., whilst for the central cases alone it was 20 per cent. and 64 per cent. respectively.

The percentage of placenta prævia therefore was nearly 2 (1·94 per cent.), and something like three out of every seven of them were centrals.

Now, Dr. Harold Clifford's *Clinical Report of the Maternity Department of St. Mary's Hospital, Manchester* (for 1911) has just come in, and it is interesting to compare the statistics of Milan and Manchester. In connection with St. Mary's there were 4662 confinements in the

year, and amongst them there were 38 cases of placenta prævia. This works out at 0·81 per cent. There were three maternal deaths, one of these being from post-partum hæmorrhage following the placenta prævia, so that the mortality was 7·8 per cent. This was less than that which was noted at Milan: unfortunately in the Manchester report central cases are not distinguished, so that we cannot carry the comparison further. The results for the child were worse in Manchester, there being 17 of the infants stillborn, whilst 10 others died later, giving a fœtal and infantile death-rate of 71 per cent. Again, there is no distinction drawn between the children in cases of central and those in the lateral variety of placenta prævia.

Whether, however, we take the Milan death-rates of 12 (maternal) and 53 (fœtal), or the Manchester ones of 7·8 and 71, it is quite obvious that placenta prævia is still one of the most dangerous of the complications of labour. Can anything further be done? Dr. Valtorta would first of all unify the definitions used in connection with the subject, so that there may be a fair chance of contrasting the results of different methods of treatment. No definition of placenta prævia is adequate, he thinks, which does not contain the anatomical as well as the clinical factor, and he prefers what he calls the Barnes-Mangiagalli definition, viz., "the insertion of the placenta upon the distensible zone of the lower uterine segment." Further, in order to distinguish between the central, marginal, and lateral varieties we must have the cervix uteri dilated to what is regarded as a sufficient extent; for, obviously, we cannot be sure that it is a central case when the os only admits the tip of the little finger. The *sufficient* degree of dilatation he fixes at 4 cms., a little less than 2 inches. Speaking generally, then, we are not to arrive at a diagnosis of the variety of placenta prævia till the os is half dilated.

Can anything be done to prevent some of the worst features of these central placenta prævia cases? Dr. Valtorta points out that in only one of all the 245 patients did the hæmorrhage supervene in great amount without a previous warning. There ought, therefore, to be a possibility of taking precautions in time, and so avoiding operations on women already exsanguine, and in some instances infected with sepsis. Bleeding in pregnancy, even when slight and transient, should be reported by the patient to her midwife or doctor, and where it is possible she should be examined by an obstetric specialist, who, from the hæmorrhages, but also from some finer diagnostic characters (such as displacement of the cervix, absence of engagement of presenting part, boggy sensation given by the cervical tissues, etc.), may be able to recognise the anomaly before labour begins. Such a patient ought then to take greater care of herself: she ought not to do hard manual labour in the later weeks, but should rest a good deal, and she ought to be within easy reach of the best treatment. Even if operative

interference becomes necessary, such a patient will have a much better chance of a good result, and will in all probability escape infection. Dr. Valtorta is really arguing here in favour of the strict medical supervision of pregnancy ; but before that is possible, patients must be instructed to recognise anomalous symptoms in their pregnancies, and to report on them to their medical attendant.

Even when the hæmorrhage is going on and the labour in progress, Dr. Valtorta is of opinion that we can lessen the mortality by putting a check upon the tendency which exists to employ surgical measures, and by trusting more to obstetric means. He sums up against vaginal Cæsarean section on account of the great friability of the lower uterine segment, and the tendency it has to bleed when torn ; he is convinced that cases of central placenta prævia calling for the ordinary Cæsarean section are extremely few, for he thinks that the rigidity of the cervix, advanced often as a reason for doing this operation, is not a true rigidity, but rather an apparent one caused by lack of engagement of the presenting part of the child ; and he is also opposed to *accouchement forcé* (either manually or instrumentally with Bossi's metallic dilator). He uses Bossi's dilator, however, in cases in which the os is not sufficiently dilated and rapidity of intervention needed ; but even then he only dilates up to 3 or 4 cms., in order to make other manœuvres possible. If the os be not dilated and the symptoms slight, or at any-rate not urgent, vaginal plugging should be employed as a temporary measure, preparatory to operative means to be used later. Here Dr. Valtorta speaks strongly (and wisely so) of the insufficient packing often introduced into the vagina by the person who is first called to the case. A few pieces of cotton-wool lying loosely in the canal is not vaginal plugging. Indeed, one feels deeply impressed (when one thinks of it) with the tremendous responsibility which rests upon the first person (be it midwife or doctor) who gives treatment to the placenta prævia patient ; in his or her hands there really lies the ultimate fate of the woman and her infant ; and there is more than a little ground for the statement that if one is able to operate in good conditions no woman ought to die from hæmorrhage in placenta prævia.

But to return to obstetric measures. If the os be sufficiently dilated and the placenta central in position, Dr. Valtorta asks us to choose between Braxton Hicks's combined version and the use of the Champetier de Ribes's bag. In both cases the placenta is perforated ; in the former a foot of the child is drawn down through the opening made ; in the other the dilating bag is pushed up through it. He himself prefers the second method, and he has reason for his preference, because he has treated 14 cases of central placenta prævia with the bag, and has lost none of the women on account of hæmorrhage (one died at the end of the first week from septic infection, but then she had been plugged in her own home before coming to hospital). He emphasises

the technique, however. The left hand is to be introduced into the vagina, and one or two fingers are to be placed in the os; the placenta is then to be perforated with a narrow pair of curved forceps; then (with a finger in the opening) the operator grasps the bag with the forceps and pushes it into the interior of the uterus; finally the blades of the forceps are disarticulated and removed one by one, leaving the bag, which is next to be distended, *in utero*. Three advantages are claimed for this method; these are the small loss of blood which is caused, the fact that it can be carried out without anaesthesia, and the greater safety for the foetus thus obtained. The bag is applied intra-ovularly, and therefore the risk of infection is very slight. Slight traction can be made on the bag, and before long the canal is sufficiently dilated for delivery of the child.

On the other side of the Atlantic Dr. Henry Schwarz of St. Louis holds views which are very similar to Dr. Valtorta's (*Amer. Journ. Obstet.*, vol. lxvi. pp. 974-980, 1912). With regard to Caesarean section they are even stronger, and he discusses all varieties of placenta praevia, not merely the central ones. He says: "No form of placenta praevia, as such, ever offers a justifiable indication for Caesarean section." He condemns version too: "Version after Braxton Hicks, in the presence of a viable child, deliberately sacrifices the life of that child, and has no place in modern obstetrics." He bases his opinion on the physiology of the mechanism of labour in the first stage, and he maintains that by proper packing of the cervix and the vagina the bleeding can be stopped. As soon as the cervix is sufficiently dilated he introduces the Champetier bag, but, unlike Valtorta, he pushes the placenta up in front of it, and does not perforate it. The case may be finished by podalic version, forceps, etc. Dr. Schwarz has treated fifty cases of placenta praevia in this way, with one maternal death (2 per cent.).

The discussion which followed the reading of Dr. Schwarz's paper — it took place at the annual meeting of the American Association of Obstetricians — was spirited; indeed, the remarks made by some of the speakers in debate showed signs of considerable excitement. One obstetrician, for instance, in arguing for the use of Caesarean section, closed his remarks with the following alarming, albeit cryptic, statement: "We were all babies once, and if we do not take care of the babies, we will never have any more mothers." It goes without saying that Dr. Gustav Zinke pled energetically for Caesarean section in certain selected cases of placenta praevia (*e.g.*, when the musculature of the uterus is diseased, or when there is incipient malignancy in the cervix); he had advocated it eleven years previously, and he maintained that there were "cases which could only be saved by Caesarean section, all the arguments to the contrary notwithstanding." In his reply Dr. Schwarz seems to have felt the electricity in the controversial atmosphere, for he closed the discussion with the following words,

which had been used by Dr. Newell of Boston: "The advocates of Cæsarean section have not recognised that their personal limitations furnish the great indication for abdominal delivery and not the exigencies of the case."

Professor Paul Bar (*Arch. mens. d'obstét. et de gynée.*, ann. i. No. 10, pp. 162-176, 1912) discusses the question of surgical interference in placenta prævia in a much calmer manner than our American *confrères*. Since 1897 he has dealt with 153 cases of this complication of labour, first at the Saint Antoine and later at the Clinique Tarnier; the total number of confinements in the same period would be about 20,000. In Paris, therefore, placenta prævia would seem to be rarer than in Milan (where there were 245 cases out of about 12,000 labours). The deaths were 14 mothers and 50 infants, or 9·2 per cent. and 51·63 per cent. respectively. Various plans of treatment were employed: in 10 cases labour was rapidly ended by forceps, version, or basiotripsy; in 8 the hæmorrhage was treated by vaginal plugging, alone or along with rupture of the membranes, version, or the bag, and in the first of these groups there was one maternal death, and two in the second; in the great majority of the cases (120) rupture of the membranes without vaginal plugging, but sometimes with version, the Champetier bag, or forceps, was the method used, and there were nine maternal deaths; in 2 cases the placenta was perforated and immediate version performed, with no maternal but with two infantile deaths; in 6 cases manual dilatation of the cervix was carried out (followed by version or forceps), with one maternal death; and in 3 cases the cervix was dilated by the Bossi instrument, with no maternal fatality. But in respect of the maternal mortality Professor Bar has this to tell us: in 10 out of the 14 deaths the cause was infection; in only 4 was it to be ascribed to the acute anæmia produced by the hæmorrhage. But another thing is still more striking: in the Saint Antoine no special effort was made to persuade patients with morbid conditions in pregnancy to remain in the hospital, whereas in the Clinique Tarnier pregnant women often came for advice, and nearly always remained in the hospital if so advised: of the 45 cases of placenta prævia treated in the Clinique Tarnier there was not a single death from infection. This is a most remarkable testimony to the value of providing pre-maternity beds in connection with our maternity hospitals.

Professor Bar thinks there is a place for purely surgical treatment in placenta prævia, but it is a very restricted place. In cases in which there is reason to fear infection and in which the cervix can be dilated without fear of tearing it, then obstetrical means (rupture of the membranes, use of the bag, combined version) are indicated; but if the cervix is not dilatable or cannot be safely dilated, and if there is the need for rapid interference, then he inclines to try the vaginal Cæsarean section. But the vaginal Cæsarean section may be contra-

indicated, viz., when the placenta is situated very low and in front (for then there might be danger of cutting into it); under these circumstances the abdominal route may be tried, only it would be, not a classic Cæsarean section but a hysterectomy that Professor Bar would recommend. If, again, there be no risk of infection, and if the cervix is dilatable, obstetric measures are to be preferred; but if the cervix be undilatable, and there is a call for haste, the classic Cæsarean section is to be chosen. It will be seen, therefore, that Professor Bar regards the sphere of surgical treatment in placenta prævia as very limited. Perhaps when the pregnancy is at full term and the infant vigorous there is supplied another reason for preferring the Cæsarean section, for it cannot be denied that the ordinary obstetric means give rather a poor chance to the child.

It is rather like passing from one end of the therapeutic scale to the other to speak of *pituitrine* in placenta prævia after Cæsarean section, but E. Hauch and Leopold Meyer (of Copenhagen) have given this new organic extract a trial in association with the obstetric device of rupture of the membranes (*Arch. mens. d'obstét. et de gynéc.* ann. i. No. 10, pp. 177-183, 1912). They found it helpful (given subcutaneously) in four cases of lateral placenta prævia, but in three other cases (central variety) it was disappointing. It can only act by strengthening the uterine contractions, and it must therefore be looked on as no more than an auxiliary in the big contest with placenta prævia.

We come back, therefore, to the question with which we began: How can we reduce mortality in placenta prævia, and especially in the central variety? The answer seems to be that, in the first place, the unification of our nomenclature by giving a sure basis for comparison of different methods of treatment will be a help. In the second place, and in view of the risks of infection and of additional hæmorrhage from tearing the cervix, the advantages of early recognition of the abnormal situation of the placenta before labour comes on and of the adoption of aseptic precautions from the very first are very great. The diagnosis of placenta prævia in pregnancy and the supervision, during their pregnancies, of patients suffering from this complication, either in their own homes or, preferably, in pre-maternity wards in the hospital, are means which may confidently be looked to for a marked reduction of mortality. In the third place, the sphere of the purely surgical operations (vaginal Cæsarean section, hysterectomy, classic Cæsarean section) is a very limited one, but these procedures may in carefully selected cases save some lives, both maternal and infantile. For the general practitioner the essential thing to bear in mind is the extraordinary importance of the early stages of interference in cases of placenta prævia; defects in aseptic technique in the first applied plans of treatment may have the most serious effect upon the ultimate result. J. W. B.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, M.D., F.R.C.S., AND ANGUS MacGILLIVRAY, M.D., D.Sc.

OCCUPATIONAL DISEASES OF THE EYE.

THE book from whose publication modern sanitary science may be said to date—Ramazzini's *De Morbis Artificum*, or, as it appeared in English translation in 1707, *The Diseases of Tradesmen*—makes little mention of the eyes of persons following the trades of that day. But in its famous chapter on the diseases of learned men, after describing the digestive disturbances and the melancholy spirits of those who use their brains too much and lead sedentary lives, the author states that scholars complain much of their eyes.

In an interesting paper read before the Medical Society of New York (*N. Y. State Journ. of Med.*, October 1912) Dr. Ward A. Holden states that the correction of refractive errors with glasses and improved artificial lighting have bettered the scholars' condition. But when we consider how frequently both external eye diseases and progressive near-sightedness are caused by over-use of the eyes in study, we must still regard the occupation of the scholar, from the kindergarten grade up, as one of the occupations most harmful to the eyes.

An excellent description of " Eye Diseases and Eye Accidents in Relation to Industrial Occupations," by Mr. Simeon Snell, makes up one chapter of Dr. Thomas Oliver's book on *Dangerous Trades*. Mr. Snell, at the Sheffield Royal Infirmary, had exceptional opportunities for studying this subject, since in that manufacturing city 30 per cent. of the male eye patients passing through his wards were admitted for accidents to the eye. Mr. Snell's classification comprises four categories of workmen. In the first category are those in whom a disturbing oscillation of the eyes—nystagmus—develops, because their occupation compels them to look constantly upward, thus straining the muscles that elevate the eyes. This occupational nystagmus is observed here and there among those engaged in various trades, but is most common in miners. Indeed a large percentage of the men who work with picks in the low galleries of coal mines are incapacitated by this " miners' nystagmus." Change of occupation is the only remedy.

In the second category are persons whose trades require the use of substances that are poisonous when gaining entrance into the body. These toxic substances cause inflammation or degeneration of the optic nerve and retina, leading to impairment of vision. A few of the commoner poisons may be mentioned here. In the preparation of mining explosives dinitrobenzine is much used. In grinding and mixing this substance dust is given off which, when inhaled, poisons the worker. Ventilation and the use of closed mixing vessels will pre-

vent its ill effects. Dinitrobenzine is used also in making aniline dyes. Hence the handling of aniline dyes or the use of aniline hair dyes may cause disturbances of vision. In the vulcanising of rubber, bisulphide of carbon is employed, and its inhaled vapour frequently affects the sight. Less frequent are the visual disturbances from poisoning with other chemicals used in trades, although a score or so are known which are sometimes toxic.

In the New York City clinics lead and wood alcohol head the list of accidental eye poisons. There are 150 trades in which lead is used sufficiently to be dangerous. The diagnosis of lead affections of the optic nerve and retina is not always easy, but it is rendered more certain if there is an accompanying sclerosis of the retinal vessels, for arterial sclerosis is the cardinal symptom of lead poisoning. In some cases lead causes increased intracranial pressure with all the general symptoms of brain tumour, including an œdema of the optic nerve head that cannot be distinguished from that due to tumour, so that with our present knowledge a differential diagnosis may not be possible. Decompressive operations have been done in a few of these cases, but the new von Braman operation of tapping the third ventricle by puncturing the corpus callosum would seem to be the operation indicated.

Lead poisoning has been greatly lessened abroad by laws which force employers to provide proper ventilation and the like. State Departments of Labour in America are now gathering statistics of lead poisoning, and for the benefit of employers the National Bureau of Labour published last July a volume of 350 pages on industrial lead poisoning in Europe and America.

Wood alcohol is still used by some brewers in the varnish used in their vats, and if forced ventilation is not employed the workman long in the vat may be poisoned by the inhaled fumes. Ten cases of death or blindness among beer vat varnishers have occurred in N. Y. State in the past two years—a matter which is receiving the attention of the State Department of Labour in America. Blindness occurs frequently among the ignorant city population from the drinking of wood alcohol knowingly, or unwittingly in cheap adulterated alcoholic drinks.

Wood alcohol in its first state has so vile a taste and odour that it cannot be used in compounds intended for internal consumption. In Great Britain the law prohibits its further distillation or rectification, and here blindness from drinking wood alcohol is unknown. In America wood alcohol is rectified and thus made less unpalatable. It is then possible to make use of it in adulterating whiskies, tinctures, essences, bay rum, and the like. Our tax-free denatured grain alcohol for use in the arts, as made up in the bonded warehouses under Government supervision, consists of 100 parts of high-proof grain alcohol, 10 parts of rectified wood alcohol, and one-half of one part of benzene. Denatured

alcohol, therefore, does not contain enough wood alcohol to be distinctly poisonous.

In the month of December last there were 70 sudden deaths among persons frequenting the Berlin municipal lodging-house, due to wood alcohol taken in cheap spirits obtained in the saloons of the neighbourhood. Within the following month the Austrian Board of Health issued an ordinance restricting the sale and the use of wood alcohol in manufactures, and prohibiting its use in any articles intended for internal consumption ; and the New York City Board of Health added a section to the sanitary code prohibiting the use of wood alcohol in any food or drink or in any preparation for external or internal use by man. Such measures as these may be of benefit, but as the offence is a misdemeanour only, the penalties are hardly deterrent. The last saloon keeper in New York City to be convicted of poisoning customers with wood alcohol was fined $50. A liquor dealer in Hungary in 1909 caused the death of 59 persons by wood alcohol poisoning, for which he was fined $750. He appealed, but recently the appellate court reaffirmed the fine and added a three months' sentence. The trial of the Berlin offenders is now in progress.

Since poisoning by wood alcohol is chiefly due to ignorance, Dr. Charles H. May has proposed that the liquor dealers, from the wholesalers down, be instructed as to its very poisonous nature. Most of the wood alcohol used by dealers in adulterating liquors, and most of that used in mixtures made at home, is doubtless bought under a trade name. Wood alcohol and denatured alcohol sold as such must be marked poison, but under a trade name wood alcohol may be bought from druggists without the poison mark and without even being labelled " for external use." When druggists are compelled to label wood alcohol "poison," under whatever trade name they sell it, we shall have much less poisoning from its use, but so long as the rectification of wood alcohol is permitted in America and other countries, certainly occasional cases of poisoning will be seen.

In the third category of tradesmen are those whose eyes are exposed to excessive light or heat and those who are required to look intently at bright near objects. The burnishers of silver, for example, suffer much from eye fatigue. Workers with molten metals, such as steel makers and those engaged in the electrical welding of steel, may suffer from serious injury to the retina if protecting goggles are not worn. And glass-blowers have long been known to be particularly subject to cataract. In these trades goggles are worn of various hues and degrees of opaqueness, according to the nature of the injurious light and heat.

Strong electric light shining into the eyes instead of being concentrated on the work in hand is, as everyone knows, a frequent source of eye fatigue, headache, and diminished efficiency. Electrical flashes due to the short-circuiting of high-voltage currents cause much eye injury

because they occur unexpectedly, and hence are not always guarded against. The skin of the lids may be burned, the lens or the retina may be permanently injured, and the shock experienced may give rise to hysterical blindness that often lasts for months.

In the fourth category of tradesmen are those whose work subjects them to the danger of injury from foreign bodies striking the eyes. Grinders, stone cutters, and iron and steel workers are the greatest sufferers from such accidents. It would seem to be a simple matter to prevent injury to the eyes of grinders, for example, by having them wear goggles, but in practice the workmen complain that glass goggles cannot be kept clean, that mica goggles flake, and that gauze mesh goggles become clogged; vision is interfered with in each case, and the work is made difficult. So while workers exposed to light and heat will wear protective goggles, workers exposed to flying particles mostly refuse to wear them, preferring to risk an occasional injury. Efforts are now being made to find a material for goggles that will not have the disadvantages of glass or mica. If, however, the grinder or lathe worker will not guard his eyes with goggles, the employer may guard the machine with safety devices. Metal hoods over the grinding wheels and glass screens before his eyes will protect the operative, and large screens of burlap will protect passers-by and workers at nearby machines.

Among the most serious of industrial eye injuries are those in which particles of metal penetrate the eyeball. Eyes so injured, notwithstanding brilliant magnet extractions of iron foreign bodies, usually are of little value, and they are, besides, a constant menace to the uninjured eye. Workmen who chip the irregularities from rough castings are particularly liable to such injuries, but chipping accidents may be greatly lessened in number by the use of pneumatic chipping machines. Cheap cast-iron tools which readily splinter also are frequent causes of blindness.

Besides the special dangers of particular trades, any occupation that requires constant close use of the eyes may lead to a progressive near-sightedness in persons who are by heredity disposed to near-sightedness. Thus type setters, proof readers, watchmakers, and men of like trades very frequently become progressively near sighted, and are thereby rendered liable to dangerous deep-seated diseases of the eye.

The greatest harm is done before the twentieth year, hence the school naturally is responsible for much progressive near-sightedness. Children whose near-sightedness is increasing rapidly should not study much, and children whose sight is defective from other causes cannot.

The Committee on Prevention of Blindness of the New York Association for the Blind is engaged in ascertaining the direct causes of preventible eye troubles and is taking measures, in co

operation with many different bodies, to eliminate such causes. Its
annual reports show that much is being accomplished along many
different lines, and other state and national societies are similarly
interested in conserving vision in America.   A. MacG.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D.

AMŒBIC DYSENTERY AND HEPATITIS.

IN 1907 Leonard Rogers demonstrated that ipecacuanha will rapidly
cure an amœbic hepatitis in the presuppurative stage, and thus prevent
the formation of amœbic liver abscess. As a result of this discovery
the annual death-rate from abscess of the liver in the British army in
India has been reduced within three years to 30 per cent. of its former
steady number, and a similar decrease has taken place in the Calcutta
European General Hospital. Since 1909 American physicians have
begun to advocate the administration of ipecacuanha in large doses as
a specific in amœbic bowel disease, but Deere and Shaw on the other
hand recently stated that the drug was unworthy of trial, as it did not
appeal to "their physiological common sense." Rogers suggests (*Therap.
Gaz.*, December 1912) these writers must not be aware of Vidder's
experiments showing that emetine, the alkaloid of ipecacuanha, inhibits
the growth of the dysentery bacillus, and even in very great dilution
kills amœbæ in bouillon cultures, and recommending the more frequent
use of ipecacuanha in the treatment of dysenteries. In his series of
cases of amœbic dysentery treated with full doses of ipecacuanha (30
to 60 grains daily), Rogers found that one-third of the cases had died,
while one-fourth declined to go on with the treatment, and left
hospital uncured. Even in some serious cases the good effect of the
drug was very evident, but nevertheless in many it was clear that
sufficiently large doses could not be administered by the mouth in
time to save the graver cases. Rogers therefore tested the effects of
the very soluble emetine hydrochloride on undoubted amœbic dysen-
teries in the mucous stools of amœbic dysentery patients, and found
that in a dilution of 1 in 10,000 it immediately produced physical
changes in them, and even in greater dilutions appeared to kill them.
He then tried the drug hypodermically in severe amœbic colitis, ex-
pecting it to produce sickness, but only after it had entered the blood,
and had thus been able to exert its specific action on the amœbæ.
Some of the successful results have already been published (*Brit. Med.
Journ.*, 22nd June, 24th August 1912), and since these were reported
he has had considerable experience of the new method during the
recent monsoon prevalence of amœbic disease.

Rogers has had equal success with the hydrobromide and the hydrochloride of emetine, but now prefers the latter, because of its greater solubility in water. The solution can safely be boiled for a short time, but it is preferable to boil the water or normal salt solution and then add the emetine salt. The dose is $\frac{1}{2}$ to $\frac{2}{3}$ of a grain for the adult, and $\frac{1}{3}$ of a grain may be given with perfect safety in children of about eight years of age. On several occasions as much as a grain has been given two, or even three, times a day in adults without causing depression or other alarming symptoms. Usually there is no sign of local reaction, but very occasionally severe pain may result at the seat of injection. Half a grain twice a day gives good results. The remarkable fact is that the fullest doses never produce sickness, and very rarely even nausea. The drug has extremely little depressing effect when administered hypodermically, and can therefore be given in full doses in severe cases of dysentery, or even after copious hæmorrhages from the bowel, without fear of adding to the shock Rogers has also given one or two one-third grain doses by the mouth on an empty stomach, allowing no food or water for three hours before and after the administration, and found that the drug was generally retained. If vomiting occurred, it was after several hours, when most of the drug must have been absorbed. In this form it is much easier to administer, much better retained, and much more effective than is an equivalent amount of ipecacuanha powder, but the oral method is less rapid and lasting in its effects than the hypodermic method.

Rogers gives his results obtained in the treatment of twenty-five consecutive cases by the new method, and compares them with thirty consecutive cases treated with ipecacuanha. All the cases were under his own care in hospital. In each series there was a large proportion of severe, acute, and advanced chronic disease in greatly emaciated subjects. In all the cases amœbæ of the pathogenic type were present in the stools.

Of the thirty treated with ipecacuanha 4 died within three days, 7 after three days, 2 were discharged very ill, 4 were not cured, and 13 were cured. Of the twenty-five treated with emetine salts, 2 died within three days, 2 died of other diseases, and 21 were cured Of the two that died of other diseases, one died of heat-stroke and the other of cancrum oris, and both had previously recovered from dysentery. These two cases Rogers regards as remarkable examples of the efficiency of the emetine treatment in patients enfeebled by advanced amœbic colitis. Leaving out of account in each series those hopeless cases which succumbed within three days of their admission to hospital, it is found that 50 per cent. of the ipecacuanha cases were cured, while 100 per cent. of those treated with emetine salts recovered from the dysentery. Rogers thinks that, on the whole, the emetine series was somewhat milder than the ipecacuanha one.

It is pointed out that an extreme degree of leucocytosis may occur in amœbic dysentery, and the degree of leucocytosis furnishes important prognostic information. Ten cases treated with ipecacuanha had counts between 25,000 and 70,000. Four of these died in hospital, 4 left uncured and in very bad condition, and only 2 were cured. Under the emetine treatment four out of five similar cases were rapidly cured; the one fatal case showed a count of 61,750 and died in less than twenty-four hours after admission.

The average number of days in hospital of each patient treated with ipecacuanha was 16·4, and that of the emetine cases 7·2. The average number of days under ipecacuanha treatment before the stools became finally normal was 11·4, and the average amount of the drug given amounted to 406 grains; while the corresponding figures for the emetine treatment were respectively 2·35 days and 2 grains of the drug, equal to 180 grains of powdered ipecacuanha. Rogers believes the most important fact is that under the emetine treatment the blood and mucus nearly always disappears from the stools within two or three days, four days being the longest period he has yet met with.

In bacillary dysentery the drug exercises little or no effect, so that the failure of the injections of emetine salts to produce a very material improvement of the stools within two or three days affords very strong evidence that the disease is not amœbic in origin. The stools should always be examined before treatment is begun, as amœbæ disappear from them in twenty-four to forty-eight hours after emetine injections are given.

Reference has already been made in the opening paragraph of this abstract to the therapeutic value of ipecacuanha in acute non-suppurative hepatitis of amœbic origin. Rogers is of opinion that the emetine treatment of this condition is nearly as great an advance on ipecacuanha as it is in amœbic dysentery. The dosage is as already stated. Should leucocytosis persist for some time after the pain and fever have subsided, it is highly probable that an abscess is present in the liver. Recent experience has shown that usually it is only necessary to remove the pus by aspiration and to inject one grain of emetine hydrochloride, dissolved in an ounce of water, into the abscess cavity through the aspiration cannula before withdrawing it, and sealing with collodion. Emetine should then be given for two or three days hypodermically. This method should supersede the quinine method. If the pus withdrawn be sterile no further treatment will be required; but if not, and especially if the abscess is a very large one, a second aspiration may be required after a week or ten days. If secondary coccal infection has taken place, the abscess must be opened and drained. Rogers states that if his present experience is confirmed it appears probable that in the large number of amœbic liver abscesses which are free from secondary bacterial infection (85 per cent.) incision and drainage will

not in future be often required, and the mortality should be greatly reduced. The important question as to whether emetine kills all the amœbæ in the body tissues, and thus prevents relapses, cannot yet be answered. Already Rogers has shown that it appears to have done so in two cases, but there still remains the possibility that a few amœbæ may survive and subsequently bring about a relapse, and reference is made to two cases in which an apparent relapse has occurred. One of these returned three weeks after leaving hospital suffering from diarrhœa, but without amœbæ in the stools, and died in three days. There was left basal pneumonia. The large bowel was distended, thin-walled in places, and adherent to surrounding structures. The mucous membrane showed many scars of healed ulcers. The liver contained a small encysted abscess free from amœbæ. The second case returned four weeks after apparent cure. There were symptoms of severe dysentery, and death occurred on the day following admission. No amœbæ were found in the stools on his second admission. Post-mortem, extensive healed scars were found in the upper part of the large intestine and typical lesions of acute bacillary dysentery in the lower half, from which cultures of Shiga's bacillus were obtained. Thus these two apparent relapses in reality furnish strong evidence that the emetine treatment can completely sterilise the whole of the tissues of the body, as far as pathogenic amœbæ are concerned. Rogers has recently found that the emetine hydrochloride can safely be injected intravenously in considerable doses. He has given half a grain dissolved in 5 c.c. of normal saline solution, injecting it very slowly into the median basilic vein. No depressing effect on the pulse resulted, and a large dose, ⅔ of a grain, was given to the patient on the same evening. On the following day a grain was given by the same method, in addition to several subcutaneously.   J. E.

NEW BOOKS.

A System of Surgery. Edited by C. C. CHOYCE. In Three Volumes Vol. II. Pp. 1105. 391 Illustrations. London: Cassell & Co., Ltd. 1912. Price 21s. net.

WHEN the first volume of this *System of Surgery* appeared we were able to express a very favourable opinion of it and the second volume, now before us, fully maintains the standard set by its predecessor. The greater part of the volume is devoted to the surgery of the alimentary canal, Mr. H. M. Rigby being responsible for the section dealing with the œsophagus, Mr. James Sherran for that on the stomach and duodenum, Mr. Alexander Miles deals with the intestines, Mr. Percy Sargent with the appendix and peritoneum, Mr. Lawrie M'Gavin with hernia, and H. S. Clogg with the rectum and anal canal. Together these form a very complete and exhaustive exposi-

tion of this department of surgery which within recent years has developed to such an extent.

The name of Mr. Sampson Handley is sufficient guarantee that the article on the breast is on modern lines. The other subjects dealt with in this volume are the malformation of the face, lips, and palate (Mr. Cyril A. R. Nitch), the tongue (Mr. W. H. Clayton-Greene), the liver and pancreas (Mr. G. Grey Turner), the urinary tract (Mr. J. W. Thomson Walker), the male genital tract (Mr. Russell Howard), the female genital tract (Mr. Victor Bonney), and the spleen (Mr. C. Gordon Watson). The numerous illustrations, several in colour, are well executed, and for the most part are specially prepared for this publication.

We look forward with pleasure to the completion of the *System* in the third volume.

The Pituitary Body and its Disorders. By HARVEY CUSHING, M.D. Pp. x. + 341. Philadelphia: J. B. Lippincott Co. 1912. Price 18s. net.

PROFESSOR CUSHING'S valuable monograph on the pituitary gland has so recently formed the subject of an abstract in this *Journal* (January 1913) that it is unnecessary to review its subject-matter in detail. The manifestations of pituitary disorder trench on so many different branches of medicine—ophthalmology, neurology, gynecology, genito-urinary surgery, and general metabolism—that this book, the pioneer in its subject, is assured of a wide circle of readers The subject is of transcendent interest, and the facts which Professor Cushing has gathered together are presented in so masterly a fashion that the book may fairly claim to be the first exposition of a new grouping of clinical pictures, and to give for the first time a complete framework of the symptoms of disease of the pituitary body. If, as the author suggests, pituitary is as common as thyroid disease, the service he does in pre-senting this basis for its clinical recognition is very great, and it is impossible to read his case records and study the very numerous and beautiful illustrations which accompany them without realising that in the pathology of the pituitary gland we have the key to many obscure disorders, the relations of which to one another have hitherto been little suspected. The book is one of the important contributions to medical literature of recent years.

The Internal Secretory Organs: Their Physiology and Pathology. By Professor ARTUR BIEDL, with an Introductory Preface by LEONARD WILLIAMS, M.D. Translated by LINDA FORSTER. London: John Bale, Sons & Danielsson, Ltd. 1912. Price 21s. net.

As Dr. Leonard Williams' foreword states, "The condition precedent of any real progress on the clinical side of a subject is an exhaustive

study of the physiological." Professor Biedl's book supplies this in the most painstaking and thorough manner. It is indeed impossible to speak in terms too high of this work, which in its original language has already exercised a powerful influence, although published so recently as 1910. The hope was then somewhat freely expressed that it might be translated into English. That the translation has been done in a manner deserving of the highest praise is certainly true. The reviewer is familiar with the German text, and has great pleasure in realising that Biedl's great work has received such a faithful rendering in our language.

It is unnecessary to-day to describe the features of a book which is already so well known to those interested in the study of the ductless glands, but we would like to see its value still further enhanced by the inclusion of a few well-chosen illustrations. Those who do not yet know this book will understand the appeal it makes to the investigator in the 140 pages devoted to bibliography. The publishers have to be thanked for the excellence of their part of the work.

Internal Secretion and the Ductless Glands. By Professor SWALE VINCENT, M.D., F.R.S.(Edin.). Pp. 464. Illustrated. London: Edward Arnold. 1912. Price 12s. 6d. net.

SWALE VINCENT'S work as an investigator of the problems of ductless gland physiology is so well known and appreciated that the present volume is assured of a warm welcome from those who have felt the need of an authoritative work of reference on this subject. In Vincent's book they will also have the satisfaction of learning the latest point of view of one who has been deeply and actively interested in the subject for more than fifteen years. Upon most of the subjects treated the author has written from first hand information, and does not fear to express his views when he is able to do so with supporting scientific observations. Thus he is one of the minority who hold the view that the parathyroid is capable of undergoing a transformation to thyroid tissue.

A very remarkable feature of the book is the completeness with which the subject has been treated in the brief space of 411 pages of reading matter, and this has been accomplished without impairing its expository value. As a work of reference its value may be readily assessed by the bibliography of 43 pages in small type, an excellent table of contents, and good index.

The book is one which appeals to the teacher and investigator especially in the domain of physiology ; but there are many who will find it a valuable treatise of a subject which is rapidly attaining great clinical importance. This is obviously Swale Vincent's opinion, as incorporated with the mass of comparative physiological data are

interesting expositions of Addison's disease, diseases of the thyroid and parathyroids, acromegaly, pathology of the thymus, ovarian medication, the medical and surgical employment of adrenal preparations, etc. It is only just to state, however, that the author intends his book primarily for the investigator and teacher, as the 93 valuable illustrations clearly show. It only remains to be said that the book is well printed on good paper.

Modern Theories of Diet. By ALEXANDER BRYCE, M.D., D.P.H. Pp. xv. + 368. London: Edward Arnold. 1912. Price 7s. 6d.

ALTHOUGH there is no lack of works on dietetics, Dr. Bryce's text-book is in its way unique. It deals not so much with the general principles of dietetics as with the applications of those which the votaries of various systems of diet advocate. These include vegetarianism, low protein diets, purin-free diets, different varieties of the fasting cure, lactic acid therapy, and a great number of others, some of which can scarcely be said to rise above the level of fads. The predominant note in the author's handling of his subject is the temperate way in which he discusses the arguments of the promoters of all these systems, and his apparent desire to extract whatever morsel of truth exists in an intolerable deal of sac. For this reason his criticisms, where they are adverse, carry the more weight, and his book is a trustworthy guide to a difficult and debatable subject.

Studies in Clinical Medicine. By C. O. HAWTHORNE, M.D. Pp. 441. London: John Bale, Sons & Danielsson, Ltd. 1912. Price 6s.

THIS volume consists of essays and clinical lectures on many subjects, which have been collected from various medical periodicals and re-published. In their present form they make a valuable miscellany of clinical studies, which can be warmly recommended as supplementary to a formal and complete text-book of medicine, for they specially deal with irregular phases of disease, and with obscure problems, such as frequently occur in the practitioner's experience, but which can seldom receive adequate attention in a regular text-book. A very wide range of subjects is travelled over, and in each, founding himself on carefully described cases, the author builds up a lucid and thoughtful commentary, with references to the classical opinions on the problem he is discussing. In this way he deals with the subject of rheumatism and rheumatoid arthritis, and the significance in the latter of the occurrence of subcutaneous nodules; with obscure clinical examples of malignant disease of the viscera; with the ophthalmoscopic signs in different diseases; and with a great variety of other interesting clinical problems. In his clear narration of cases, in critical analysis, and in full and scholarly acquaintance with the classical literature of the

subjects he is dealing with, the author has produced a volume of interesting and admirable essays in clinical medicine.

Surgical Diseases of Children. By W. F. CAMPBELL and LE GRAND KERR. Pp. 693. London: D. Appleton & Co. 1912. Price 25s.

IN many respects the surgical affections of children form a perfectly distinctive group, but there are comparatively few books which deal with the subject as an entity. The surgery of childhood imposes a problem peculiarly difficult, and the authors of the work before us have done justice to their subject. The introductory eight chapters on general considerations and methods of examination are excellent, more especially that portion which deals with the gaining of the child's confidence. Naturally congenital errors occupy a considerable portion of the book, and they are fully considered. We appreciate the systematic manner in which each condition is dealt with, etiology, pathology, and treatment following one another in logical sequence. If there is anything lacking, it is a more extensive description of the pathological changes and their intimate bearings upon symptoms and treatment.

Of course there are a number of statements open to question. The bloodless reduction of intussusception is recommended, and the failure of the attempt is to be the signal for operation—but how are we to judge of the success? Nor can we for a moment agree with the remark that during the first two years of life the operative treatment of inguinal hernia is neither safe nor satisfactory. But one of the most glaring errors, and one which might lead to serious consequences, is the recommendation that a retro-pharyngeal abscess should be opened by an incision along the anterior borders of the sterno-mastoid muscle. That portion of the book which deals with the pre-operative preparation of the skin is scantily written; no detail is given, and the iodine method is mentioned only in relation to its use in eczematous conditions of the skin. In spite of such imperfections, however, the book is a good one; the illustrations are numerous and excellent, and the type is large and pleasant.

The Diseases of Children. Edited by Dr. M. PFAUNDLER and Dr. A. SCHLOSSMANN. English Translation edited by HENRY L. K. SHAW, M.D., and LINNÆUS LA FÉTRA, M.D. In Five Volumes. Vol. V. Pp. xiv.+364. Philadelphia: J. B. Lippincott Co. 1912. Price 21s. net.

THE addition of a volume on surgical diseases to Pfaundler and Schlossmann's well-known *Handbuch* would seem to have been an afterthought, because, although on the title-page of this volume the work is said to be in five volumes, the book as it first appeared was described

as in four only. Moreover, the medical part of the work appeared in German in 1906 and in English in 1908, so that there has been some delay in issuing the present volume. The subject—surgery as it applies to childhood—is approached from the view-point of the practitioner; no attempt is made to elaborate pathological changes or minutely to detail surgical technique. The intention is rather to offer a guide to the borderland where treatment leaves the domain of internal medicine and enters that of surgery and orthopædics. The book is divided into six sections—congenital diseases, disturbances in post-fœtal development, infections, injuries, affections of neurogenic origin, and tumours. From the preface we gather that Lange (Munich) and Spitzy (Gratz) are joint authors, but the name of the latter only appears in the chapter headings. In the section on congenital deformities considerable space is given to cleft palate and harelip, operation for the former being advised at the age of 18 to 24 months. Whether or not hæmatoma of the sternomastoid really causes wry-neck is a matter of some doubt; the view expressed is that it may do so, but that other factors come into play. Early operation (open method) is advised. No very definite guidance as to the best treatment of extroversion of the bladder is given. The writers do not seem to have had much experience of Maydl's operation and its modifications, and speak indefinitely of the way in which the lower part of the bowel takes on the function of a bladder in successful cases. Thus the fact that in these cases fæces and urine are voided independently is not referred to. The treatment advised in surgical tuberculosis is conservative in the extreme. The authors discountenance extensive operations on tuberculous glands, bones, and joints, and rely chiefly on general measures, along with Bier's treatment. The paramount necessity for immediate operation in appendicitis is not insisted on to the extent which is done in this country, and the question is left in some measure open. To criticise the volume at length would require our unduly extended review, and we need say no more than that the descriptions of disease and treatment given are interesting as representing the practice in Gratz and Munich, and differ in some degree from what we here are accustomed to in this country. The book is well illustrated and ought to prove useful, but it is scarcely so authoritative or on so high a plane of excellence as the first four volumes. A flaw in these—the omission of all the bibliographical references of the original text—is repeated in this volume, and the translation, as formerly, is in many places clumsy. There is a full index.

Diseases of Children. By BENJAMIN K. RACHFORD. Pp. 783. New York and London: D. Appleton & Co. 1912. Price 25s. net.

THIS book can be thoroughly recommended to the general practitioner as one which will give him a very full and clear account of the

diagnosis and treatment of disease in children. As the author intends his book to be "a practical clinical treatise for practitioners and students of medicine," he rightly claims to be under no necessity of filling his pages with "long pathological findings and unnecessary etiological discussions." For example, when dealing with diabetes mellitus, he says: "The etiology and pathology of diabetes in the child are the same as in the adult." Thus he can go more fully and carefully into the questions of diagnosis and treatment. In this he has succeeded admirably. The first section of the book is occupied with a broad survey of the general hygiene of infancy, and excellent advice is given regarding such points as "rest and sleep," fresh air, the nursery, clothing, etc. Dr. Rachford next discusses the diseases to which the newly-born infant is most liable, and then passes on to treat of the important subject of infant feeding. He then takes up the diseases of the various systems : these are treated in an exhaustive and full manner. Numerous illustrations add to the value and interest of the work.

Infant Feeding. By CLIFFORD G. GRULEE, M.D. Pp. 295. Philadelphia : W. B. Saunders Co. 1912. Price 13s net.

IN reading this book it is impossible to escape being impressed by the great influence which German methods and teaching are exerting on American medicine This is particularly striking in a book on infant feeding, the subject of all others, perhaps, in which American pediatric physicians had struck out a line of their own. In the book before us, instead of the dissertation on percentage feeding, which only a few years ago would have filled the greater part of its pages, the author frankly adopts the teachings of Czerny and Finkelstein in practically their entirety. The output of work on infant feeding from Germany during the past few years has been so great that few even of those especially interested have been able to keep pace with it, and for this reason alone Dr. Grulee's concise presentation of the subject is welcome. We regard his book as, in many ways, a distinct advance on most of those on the subject, although probably he is more enthusiastic than critical about the latest developments of infant feeding. The book includes chapters on the exudative diathesis (a clinical group of symptoms rather arbitrarily associated, according to British notions), rickets, Barlow's disease, and spasmophilia. In the last of these we noted that reference to facial irritability was omitted, although the sign is, practically, a much more useful guide to the presence or absence of latent tetany than the electrical reaction of the muscles. The book is, however, an excellent epitome of the most recent views on infant feeding.

Geometrical Optics. By ARCHIBALD STANLEY PERCIVAL. London : Longmans, Green & Co. 1912. Price 4s. 6d. net.

MOST of the text-books on ophthalmology include a discussion of the nature and treatment of the ordinary optical defects which may be met with in the eye. This is not always, however, preceded in the chapter devoted to that subject by a sufficiently comprehensive introduction to geometrical optics. In order that optical correction, where possible, may be made in anything but a rule of thumb manner, and that the many optical problems presented by the eye may be understood, some knowledge of geometrical optics is essential. A short treatise on geometrical optics alone is therefore a useful adjunct to the ordinary ophthalmic text-book.

Percival's work, while it does not enter very fully into many of the more complex problems, which would only be suitable perhaps in an exhaustive treatise on physiological optics, contains a useful elementary account of the subject of refraction through lenses and prisms, magnification, apparent brightness of images, etc. Graphic methods of demonstration are used in addition to the ordinary analytical ones. To many students this will no doubt prove useful. The book may be confidently recommended as an introduction to the special study of eye diseases. No more is indeed required of the student than to refresh his memory on much that he has already had to master for his preliminary scientific examination. This being the case, it could hardly be expected that any originality of treatment would be found. Anyone conversant already with the elements of geometrical optics will certainly find nothing new—indeed one misses a good deal that might well have been introduced, such as a mention and description of Gullstrand's ophthalmoscope, of the newer lenses for short-sight, of the correction of spherical aberration by lenses having non-spherical surfaces, etc. So far as it goes, however, the book is an excellent guide to the subject of which it treats.

Diseases of the Eyes. By C. D. MARSHALL, F.R.C.S. Pp. 302. London : University of London Press. 1912. Price 10s. 6d.

OF the London medical publications given out by Messrs. H. Frowde and Hodder & Stoughton there has now appeared the volume dealing with diseases of the eye, from the capable pen of Mr. C. D. Marshall. It is well done. The accounts of the various diseases are sound alike from the pathological and the clinical point of view, the ground seems to us completely covered without redundancy, and many of the numerous diagrams are admirable and effective. Mr. Marshall is dogmatic in many of the statements—a good quality of which we approve in a book of this class, even when we differ (as we do here and there) from the view expressed by him—but it is a moot point whether the fact that there are other views should not sometimes be

indicated, though not in such a way as to unsettle the mind of the reader. Is it not better to treat the reader as an intellectual beginner rather than as a dumb animal, in whose case reasons are not required? Mr. Marshall's method is capital with the student who confines his attention to his methods, but it is apt to injure the author with one who reads more widely and sees the practice of Mr. Marshall's colleagues.

We regard the book as, on the whole, a very good guide for the student, but that does not hinder us from pointing out one or two blemishes—rather the contrary, since these can be corrected in any further issue. We think it a pity there are no coloured diagrams; these are much more convincing than the black and white. Again, there is here and there a little carelessness with names (Gräefe, Le Grange, for example), and sometimes even a want of precision in statement, which is apt to give quite a false impression. Thus, on p. 206, . . . "the retina may retain its red appearance," but the retina never possesses a red appearance. Some statements, too, are a little reckless, *e.g.*, that if an operation for cataract is performed in presence of regurgitation from the lacrimal sac "the eye is certain to be lost" (p. 162). We should never think of doing such a thing ourselves, but is Mr. Marshall aware that at least one prominent surgeon does not hesitate to operate in these circumstances, and does so with success? Examples also occur on page 248 (5), 145, and elsewhere. A statement like one of these reacts unfavourably on the author of it.

But what seems to us more serious from some points of view (though less important from others) is the constant recurrence of incorrect English and of examples of downright bad grammar, such as would not pass muster in a schoolboy's essay—"It may act like it does in syphilis" (249); "it is not advisable to dilate the pupil like it is with needling" (168); "make the patient read a book and gradually approach it to the eye" (260); "the ciliary body is frequently the seat of inflammatory changes, which, if they spread forwards and affect the iris, the condition is called iridocyclitis" (123). These are only examples out of very many instances.

It will be seen, then, that the faults in the book are simple enough to mend, and its good points are permanent. Why does Mr. Marshall describe it as upon diseases of the *eyes*? It has been customary up till now to refer to diseases of the *eye*, and this is the more correct form.

Forschungen und Erfahrungen, 1880–1910. Eine Sammlung Ausgewählter. Arbeiten von Professor Dr. Sir FELIX SEMON, K.C.V.O. Bander I. und II. Berlin: August Hirschwald. 1912. Price 32 marks. THE collective works of Sir Felix Semon, which occupy two large volumes, have been recently published in German. It falls to the lot

of few men to overtake so much original and valuable research, and we heartily congratulate the author on having reproduced his many papers in this form. It is unnecessary to recapitulate Semon's valuable contributions to laryngological literature. His investigations into the innervation of the larynx, his work on malignant disease of the larynx and its treatment by thyrotomy, and his descriptive account of the acute septic inflammations of the throat and larynx must always remain as authoritative statements. To all who are interested in the diseases of the upper air-passages, and indeed to a much wider scientific audience, these volumes will form a valuable addition to the library.

Text-Book of Ophthalmology in the Form of Clinical Lectures. By Professor ROEMER, Greifswald. Translated by Dr. MATTHIAS LANGTON FOSTER. 186 Illustrations and 13 Coloured Plates. Vol. I. London: Rebman, Ltd. Price 10s. 6d.

ROEMER'S *Text-Book of Ophthalmology* appeared in 1910, and the freshness of its style and method as well as the excellence of the subject-matter well warrant the early appearance of an English translation. In the German edition of the whole work there are 1028 pages, and the present volume covers 342 pages of the German edition. Professor Roemer considers that a student's study of ophthalmology should extend over two semesters. We wonder if German students are expected to master the thousand and odd pages of his text-book. To the book itself we must accord the very highest praise. Though from its form necessarily somewhat pedagogic in tone, it is learned, original, and stimulating. Professor Roemer is widely known as an investigator of the very first rank, and speaks with special authority on immunity and allied subjects. On the clinical side the book is very ably written, the descriptions of diseased conditions being given in a clear, exhaustive, and graphic fashion. The volume before us treats of—I. The Examination of the Eye; II. Diseases of the Cornea and Conjunctiva; III. Diseases of the Iris; IV. Diseases of the Lens. The translation has been very well done.

A Manual of Immunity. By ELIZABETH T. FRASER, M.D.(Glas.). Pp. 199. Glasgow: James Maclehose & Sons. 1912. Price 5s. net.

THE compiler of this little manual has succeeded in turning out a useful volume of reasonable compass; and for the hard-worked student and the busy practitioner a book dealing with a highly complex and rapidly evolving science in a simple and not too lengthy manner is a distinct boon. The mere male commentator may perhaps presume to smile at the numerous little feminine touches that crop up here and there—the use of exclamation and rhetoric, which strikes the cold-blooded scientific man as a little out of place in a book of this nature

The picture of a bacterium "shackled by a grim amboceptor which links it on to a complement, which thereupon proceeds to rend it to pieces!" the suggestion of a "twin-soul!" relationship between foreign molecule and cell-receptor, and her appeal, even though of a negative description, to Tennyson, will serve as examples to show that the authoress does not approve of the dry-as-dust diction of the common-place orthodox scientific writer. She is evidently a keen disciple of Bordet, but this does not justify the intensely "superior" attitude adopted towards the work of Ehrlich. A carping critic might also suggest more care and uniformity in writing and in the use of terms. Thus in the course of a few pages may be found the variants: B. Typhosus, B. typhosus, B. Typh., Bac. Typh., Bac. Typhosus, the Typh. bacillus, and typhoid bacilli; whilst derivations such as "'hapto,' to fasten," "'phagein,' to eat," etc., might with advantage be made uniform as regards tense, etc. The subject-matter is excellent, and such minor defects may easily be remedied in a second edition, together with the misprint "B. enteritides" on p. 26. The book is to be commended as a useful, readable, and up-to-date, and at the same time concise, introduction to the subject of immunity.

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The Wassermann Reaction: Its Technic and Practical Application in the Diagnosis of Syphilis. By JOHN W. MARCHILDON, B.S., M.D. (St. Louis). Pp. 98. London: Henry Kimpton. 1912. Price 6s. 6d.

THE author explains the Bordet-Gengou phenomenon, and its application by Wassermann, Neisser, and Brück in the diagnosis of syphilis. His description of Wassermann's own method is complete and accurate, and should enable anyone with some experience of hæmolytic work to carry out the test correctly and to furnish proper safeguards and controls. He discusses the reaction in relation to syphilis and to other diseases, and also the modifications caused by therapeutic measures. The only modifications of the *method* of conducting the test which are referred to—but that only to be dismissed as untrustworthy—are those of Noguchi and of von Dungern. One should have expected some mention of the method introduced by Mackenzie and Browning, seeing that its importance, especially in experimental investigations, is becoming widely recognised. This being omitted by the author, we are not surprised to find, in addition, that he has found artificial antigens worthless. Though Noguchi's first paper on the "Cultivation of the Spirochaete Pallida" appeared at the end of 1911, we find repeatedly in this book the statement that the organism cannot be cultivated artificially.

We notice a considerable number of slips and mistakes, some indicating a want of care in proof reading. The most important is in the table upon p. 21, in which the contents of tubes 9 and 10 are

incorrectly stated : presumably the former should not contain ambo-ceptor, whereas the latter should do so.

Smallpox and its Diffusion. By ALEXANDER COLLIE, M.D. Pp. 58. Bristol : John Wright & Sons, Ltd. Price 2s.

IN this little book Dr. Collie analyses the experience of the Homerton Smallpox Hospital from 1871 onwards, with reference to the prob-ability of aerial convection of the infection. He makes a very strong case against such transmission of the smallpox virus, and his numerous diagrams demonstrate that, if aerial convection is really of frequent occurrence, the situation of the hospital and the conditions prevailing at the time should certainly have favoured it. For instance, a large workhouse infirmary stood within 90 feet of the smallpox wards, which in the year 1871 contained no less than 400 patients. No one in the infirmary was infected, and in the adjoining workhouse the incidence of the disease was very slight and was no more than in another similar institution a quarter of a mile further distant. Many similar examples of the escape of the population in the immediate neighbourhood of the hospital are given, and the general evidence of the book casts grave doubt upon the aerial convection theory. Many of us who think that it is unfortunate that this theory has been adopted in official quarters will welcome this important contribution to the literature of the subject.

Traitement de la Tuberculose. By ALBERT ROBIN, Professeur de Clinique Thérapeutique a la Faculté de Médecin de Paris. Pp 640. Paris : Vigot Frères. 1912. Price 8 francs.

PROFESSOR ROBIN is distinctly prolix, and aims at doing too much by endeavouring in this single volume to cover the whole field of treat-ment of tuberculosis, dealing with that disease in relation to every organ of the body. He dwells at considerable length upon " le terrain tuberculisable " in such a way as to suggest that he and a few others are singular in recognising this well-known condition. Several chapters might have been omitted with advantage at this stage. Then, again, it is surely unnecessary to devote ten large pages to expatiating upon cod-liver oil

In the chapters devoted to tuberculin therapy he wisely deprecates a prevalent idea that the administration of tuberculin is a simp'e question of technique. "On the contrary," he says, "it is very diffi-cult to employ, and its use demands experience and care on the part of the physician and much patience in that of the patient."

The volume adds little to our knowledge, but is distinctly readable, and should impress instruction to anyone with the leisure to read it.

La Maladie du Sommeil au Katanga. By F. O. STOHR, M.B., B.Ch.(Oxon.).
    Pp. 83. With Nine Maps and several Illustrations. London :
    Constable & Co. 1912.

THIS report, in which the author furnishes the result of two years'
work in the investigation of sleeping sickness, is of particular interest,
since the area in which the work was performed is in close proximity
to British territory, being bounded on the south and east by Northern
Rhodesia.

The geography of the country, the habits and customs of the
natives, and the distribution .of glossina palpalis and G. morsitans in
relation to sleeping sickness are carefully described, the description
being accompanied by excellent maps and photographs.

It would appear that in the vast majority of cases the infection is
conveyed by G. palpalis, G. morsitans playing a very minor part.

A feature in the report is the frank criticism of the measures
adopted by the Belgian authorities for the prevention and treatment
of the disease in this area.

As regards treatment, the author has no great faith in any of the
drugs at present employed, but admits that fairly good results may be
expected from the atoxyl group, provided the treatment is commenced at
a very early stage of the disease and continued for a prolonged period.

To those interested in the problem of sleeping sickness the report
may be recommended as a well-written account of a careful and pro-
longed investigation by a practical man.

Public Health Law. By WILLIAM ROBERTSON, M.D., and ARCHIBALD
    M'KENDRICK, F.R.C.S.E. Pp. 397. Edinburgh : E. & S.
    Livingstone. 1912. Price 5s. net.

THIS little work, as its sub-title denotes, deals with the laws applicable
to England and Wales and Scotland, but where advisable the sections
of the Public Health Acts of London and those relating to Ireland have
been drawn upon for purposes of comparison. The arrangement of a
work like this is of much importance to those likely to consult it and
this has been well kept in mind. The Acts specially applicable to
Scotland have priority of place, those of England and Wales next, and
those general to the United Kingdom make up the remainder of the
book. A concise résumé of each section of the Acts, so far as they apply
to public health matters, is given, and in most places good cross refer-
ences show clearly where to find similar provisions in other Acts. The
duties of officials, medical officer of health, and sanitary inspector respec-
tively are laid down, and for both of these the book will prove a valuable
work of reference, being in fact an excellent epitome of all that is within
the corners of the Acts pertaining to sanitation. A chapter on vital
statistics is added at the end, with some exerpts from Model Bye-laws.
We note with interest that the comparative mortality of the medical

profession seems to have fallen considerably, *i.e.* from **1122** to 952 within the last twenty years.

The Psychology of Insanity. By BERNARD HART, M.D.(Lond.). Pp. 172. Cambridge University Press. 1912.

THIS is a compendious and most lucidly written account of the modern "psychological" conception of insanity, according to which, and contrary to the hitherto prevailing assumption, "mental processes can be directly studied without any reference to the accompanying changes which are presumed to take place in the brain." The teaching of Freud is mainly followed throughout, except that our author lays less stress than does the Viennese master on "sex" as a cause of insanity. We would suggest that the English equivalent for the German word *zensur* is "censorship," not "censure."

NEW EDITIONS.

A Text-Book of Obstetrics. By BARTON COOK HIRST, M.D., Professor of Obstetrics in the University of Pennsylvania. Seventh Edition. Pp. 1013. With 895 Illustrations, 53 in Colours. London: W. B. Saunders Co. 1912. Price 21s. net.

NEITHER obstetrics nor gynecology has been benefited by the attempt to separate the two subjects during the last decade. This is now being realised, and in the majority of American and continental universities every opportunity is being taken to further the closer union of the two branches of work both in teaching and in practice. Professor Hirst's book, the popularity of which is attested by seven editions and several reprintings, is a witness to this essentially sane reunion. It contains a sufficiency of gynecological information to enable a practitioner to follow up the results of the accidents and complications of childbirth without the need of having recourse to another book on gynecology alone, which latter is probably written from the standpoint of the operating gynecologist. When it is remembered that the vast majority of gynecological affections are the result of childbearing, more or less directly, it becomes obvious that prophylaxis and prevention are only to be obtained by keeping in mind, and teaching, an intimately coherent view of cause and effect. Professor Hirst's book has long been a standard work, and this last edition fully maintains the prestige which its forerunners have won.

The Practice of Gynecology. By WM. EASTERLY ASHTON, M.D., Professor of Gynecology in the Medico-Chirurgical College, Philadelphia. Fifth Edition. Pp. 1100. With 1050 Illustrations. London: W. B Saunders Co. 1912. Price 27s. 6d. net.

THIS book has from the first been written with the intention to "take nothing for granted" in the way of knowledge of the subject. Hence

the colossal proportions of the volume, which is of necessity full of repetitions. Many other criticisms are discounted by this avowed purpose of the book, which gives the fullest information on all practical points, and admirably fulfils the intention with which it was written. It is emphatically not a book for students, but the practitioner who has to depend on books for his information will find it a mine of instruction. We should like to enter a protest with the publishers against the objectionable Teutonic habit of spacing out the lettering in any sentence which it is desired to emphasise. It looks very ugly on the page, is very difficult to read, and infinitely less effective than strong black lettering.

Aids to the Diagnosis and Treatment of Diseases of Children. By John M'Caw, M.D., R.U.I., L.R.C.P.(Edin.), Senior Physician to the Belfast Hospital for Sick Children. Fourth Edition. Pp. 431. London: Baillière, Tindall & Cox. Price 4s.

The fact that the present volume is the fourth edition is the best proof of the steady success of Dr. M'Caw's book. It is an excellent example of *multum in parvo*, for in small compass it gives a really comprehensive survey of the diseases of children, including symptomatology, diagnosis, and treatment and not omitting the specific fevers. The whole subject is presented in a brief, succinct, and yet clear manner, and fairly numerous references to the literature are provided for those who desire a further and more special investigation. The plan of the book follows closely that of the larger text-books on this subject, beginning with the normal physiology, nutrition, and hygiene of childhood, and then proceeding to a description of diseases arranged under the various systems. It can be highly recommended as a reliable guide and handbook to practitioners. The only criticism we would suggest, and it is rather for the publishers than the author, is that the excellence of the text is worthier of an ampler page, a larger type, and more numerous illustrations.

Lectures on Clinical Psychiatry. By Dr. Emil Kraepelin. Authorised Translation from the German. Second Edition. Revised and edited by Thomas Johnstone, M.D. Third English Edition. London: Baillière, Tindall & Cox. Pp. xviii.+368. Price 10s. 6d. net.

No long notice is required for what is virtually a reprint of these classical lectures by Professor Kraepelin. Those who have not an earlier edition ought to lose no time in securing this one, for no more vivid, readable, and useful presentation of the complicated subject of insanity can be had. The substance of Kraepelin's lifelong work, with his epoch-making generalisations, is here given, and in each lecture two or three cases are introduced, the comments on which

form a guide to clinical investigation. Dr. Johnstone has added useful appendices on maniacal-depressive insanity and dementia præcox. The book is beautifully bound in green, and paper and print are of the best.

Vaccine Therapy: Its Theory and Practice. By R. W. ALLEN, M.D., B.S. (Lond.). Fourth Edition. Pp. 436. London: H. K. Lewis. 1912. Price 9s.

As the author says in his preface, the scheme of the work has been so altered in this edition as to convert it into a systematic account of the applications of vaccine treatment to the bacterial diseases of the various parts of the body. Not only has the arrangement of subjects been altered, but much new material has been added, increasing the bulk of the volume by 165 pages. The old parts have been rewritten, so that to all intents and purposes this is a new work, which is a distinct improvement, even admitting the excellence of the manual whose place it takes.

The book may be divided into a general and a special part, the general part containing a discussion of the antibodies, their nature and source ; of the nature and technique of the opsonic index ; of the preparation of vaccines, and the rationale of vaccine treatment. The more special portion deals in detail with vaccine treatment of diseases of the skin and subcutaneous tissues ; the bones and joints ; the alimentary, circulatory, respiratory, and genito-urinary systems ; the eye, ear, nose, and throat.

The author refers freely to the work of others, but he bases his opinions to a great extent upon a wide personal experience, thus enhancing the value of the work. Though undoubtedly Dr. Allen is an enthusiast, yet his enthusiasm is tempered with sound judgment. The book retains its position amongst the best existing guides to vaccine treatment.

A Text-Book of General Bacteriology. By E. O. JORDAN, Ph.D. Third Edition. Pp. 604. London: W. B. Saunders Co. 1912. Price 13s.

THREE years ago we reviewed the first edition of this work, and after perusing this new edition we find no reason to alter the favourable opinion formerly expressed. In comparing this with the former edition we find that practically the only changes are of the nature of additions, but these are important, and apparently adequately traverse the ground opened up by investigators during the past three years, and bring up the text to date. Among the subjects which are now included for the first time, or to which important additions have been made, may be mentioned the Wassermann reaction, the cultivation of treponema pallidum and of the leprosy bacillus, the concentration of diphtheria

antitoxin, inoculation against typhoid fever, acute poliomyelitis, scarlet fever and measles, typhus fever, the sporotrichoses, rat leprosy, the iron and sulphur bacteria, the relation of bacteria to food assimilation and to the destruction of cellulose, the bacteriology of milk and cheese, bakery fermentations, the retting of flax and hemp. The opsonic technique and the antiformin and Indian ink methods are fully described.

We regret that the author has not seen it advisable to give details of any of the modified Romanowsky stains, such as Leishman's, Wright's, or Jenner's. No one who has had the slightest experience of the convenience and utility of these modifications would, we feel sure, go back willingly to the original stain.

The author has now adopted the name *bacillus* melitensis for the causal organism of Mediterranean fever, but still places it under the heading "Other Pathogenic Cocci," along with the micrococcus catarrhalis, the M. zymogenes, and the M. tetragenus, thus dissociating these from the other cocci and placing them after certain of the bacilli. This is no doubt a slip.

We note that he considers that the chemical nature of the relation of toxin and antitoxin may be held as proved. This is by no means universally accepted. The illustrations are not up to the standard of the text. In spite of these criticisms we again cordially recommend the work.

Forensic Medicine and Toxicology. By C. O. HAWTHORNE, M.D. Third Edition. London: Edward Arnold. 1912. Price 6s. net.

IT would be difficult to find a text-book on this subject containing more good matter in the same space. The author, for want of room, omits illustrative cases, referring for these to the larger treatises. He has given, however, recent cases not in these books. A few terms taken from other text-books might possibly be replaced by better. For example, *agonal*, a term applied to injuries received by a person who, suddenly seized by a fit, falls down on the street. *Agōn*, "a place of control," "national games," gives the idea of a *struggle*—precisely the reverse of what happens. *Agoral* (*agora*, "a market place," "a public place") would be better; moreover, we already have the word in *agora-phobia*. *Neuronic*, applied to poisons, would possibly be better than *neurotic*. As to finger-marks (p. 50), the finger-marks of *all* persons convicted of crime are recorded in Scotland Yard, hence criminals can scarcely escape identification. As to *spontaneous combustion*: at Brook-wood Crematorium, three and a half miles from Woking, it takes two hours at a temperature of 1800 F. to consume a body. We have an open mind on the subject, and should be much interested to see any human body *per se* develop 1800° F. of heat.

NOTES ON BOOKS.

IT is difficult to realise to what class of readers *Infections of the Hand*, by Allen B. Kanavel, M.D. (Baillière, Tindall & Cox, price 15s. net), will appeal. General practitioners will find it too long and diffuse for guidance in their daily practice, while hospital surgeons will be disappointed with it as a work of reference. Some parts are unnecessarily long, such as the account of the sheaths of the tendons, and the results of bursting them by injections in the cadaver, while certain subjects are inadequately treated where information is more required. Very little is said, for instance, about sloughing of tendons and the reason why it is so apt to occur in suppuration within the synovial sheaths, and passive congestion as a means of treatment receives a scanty notice.

Bier's method has been found invaluable in the treatment of acute inflammations of the hand and fingers by surgeons in this school and elsewhere, and Dr. Kanavel, in alluding to it as of comparatively little value, shows that he does not properly understand it. He has evidently not read Professor Bier's papers or book, and this might reasonably have been expected from an author who sets out to write a monograph on infections of the hand.

The Carrier Problem in Infectious Diseases, by J. C. G. Ledingham, M.B., D.Sc., and J. A. Arkwright, M.D. (Edward Arnold, price 12s. 6d.). An authoritative work on this interesting subject has been much needed, and the general editors of the "International Medical Monographs" are to be congratulated on having secured two such acknowledged experts as Drs. Ledingham and Arkwright to furnish us with the desired information. Only those diseases in which the human carrier has been proven a source of danger are treated of, and a large part of the book is devoted to a masterly exposition of the typhoid carrier question by Dr. Ledingham. While much space is taken up by a very full summary of the literature concerning each disease, the practitioner will have no difficulty in finding suggestions for the treatment and management of carrier cases, and the importance of the carrier, from the epidemiological point of view, is fully discussed. Diphtheria and cerebro-spinal meningitis receive adequate treatment, and chapters on dysentery and cholera have been included for the assistance of medical men practising abroad. It must be admitted that in some diseases the modes of treatment suggested have not proved very efficacious, and there is yet much to be learned on the whole question, but in the meantime this volume will be found of the greatest assistance to all who are interested in epidemiology.

On Squint: Etiological Researches, Pathogeny and Mechanism of Treatment (Du Strabisme: recherches étiologiques, pathogénie, mécanisme du traitement), by Dr. Pierre Lagleyze (Paris, J. Rousset, 1913, price 15 fr.).

This work, of over four hundred pages, is based upon the author's personal experience of nearly four thousand cases, extending over a period of twenty years. As the title indicates, the book is designed more as an academical treatise than a practical handbook, and deals mainly with theoretical questions as to the causation of squint and the mode of action of remedial procedures, such as operation or correction of refraction, while attention is directed to many points in relation to which the teaching of present text-books might with advantage be reconsidered. The treatise is intended purely for oculists, who will not fail to find in it much that is of interest, though some of the views expressed are unlikely to be generally accepted in this country.

The Simple Carbohydrates and the Glucosides, by E. Frankland Armstrong, D.Sc., Ph.D. (Longmans, Green & Co., price 5s.). This, the second, edition of the monograph on carbohydrates and glucosides has been brought up to date, and an interesting chapter on the function of carbohydrates and glucosides in plants has been added. Although the volume is packed with information on a very complex subject, the author has succeeded in presenting it in a very clear and readable manner. A comprehensive bibliography is appended. To medical readers the monograph would gain greatly in interest if in a subsequent edition the author would point out more fully the significance of the chemical facts from the point of view of human physiology and pathology.

Goulstonian Lectures on " Modern Views upon the Significance of Skin Eruptions," by H. G. Adamson, M.D., F.R.C.P.(Lond.) (John Bale, Sons & Danielsson, Ltd., 1912, price 3s. 6d.). The title of this little book sufficiently explains its scope. It is written in an interesting and simple fashion. Numerous illustrations add greatly to its value. Dr. Adamson is to be heartily congratulated on his work. We would very strongly recommend every practitioner who takes an intelligent interest in his work to read this book.

Pye's Surgical Handicraft (John Wright & Sons, Ltd., 1912, price 12s. 6d. net) is now a classic, and we need not do more than record the appearance of a sixth edition, which has been ably edited by Mr. W. H. Clayton-Greene.

A Handbook on Surgery, intended for Dental and Junior Medical Students, by Arthur S. Underwood, M.R.C.S., L.D.S.(Eng.), and Bayford Underwood, M.B., B.S.(Lond.), L.R.C.P., M.R.C.S.(Eng.) (John Bale, Sons & Danielsson, Ltd.). This small book, which goes easily into the pocket, contains all that a *dental* student need know of general surgery, with certain important exceptions. Amongst these may be mentioned the subjects of acute and chronic abscess, cellulitis, and metastasis of tumours, all of which are far too scantily treated, even for a work of this kind. If this is attended to in the next edition, a useful book will result and a felt want be supplied. Its use should,

however, be restricted to dental students. Even the junior medical student would expect to be told something, say, about peritonitis or about whitlow in a work which devotes ten pages to diseases of the eye and three to diseases of the thyroid gland.

Treatment after Operation, by Wm. Turner, F.R.C.S., and E. Rock Carling, F.R.C.S., with chapters on the Eye by L. V. Gargill, F.R.C.S. (Hodder & Stoughton, and Henry Frowde, price 10s. 6d.). This well-written book is intended to help to guide the practitioner through the first few days after an operation performed in the patient's house. It will, however, also be of use to house-surgeons, and should be read by every man about to go into private practice. In Chapter II. we find it stated that for local analgesia 20 per cent. novocaine is employed. We have obtained excellent anæsthesia with $\frac{1}{4}$ to 1 per cent. Nor do we agree with the advice that the inner segment of a tracheotomy tube should be fixed in its sheath by a clip. After gastro-enterostomy it does not appear to us to be necessary to refrain from giving aperients by the mouth for ten days, or after intestinal suturing to resort to rectal feeding for the first three days. In spite of these and other minor details with which all will not agree, the book is a most useful one, and contains many hints for which the practitioner will be thankful.

The Medical and Surgical Reports of St. Luke's Hospital (vol. iii. 1911) (Brooklyn, N.Y., William G. Hewitt) contains, in addition to the statistics of the hospital, a series of valuable papers by members of the staff.

REPORTS AND TRANSACTIONS OF SOCIETIES.

The 29th volume of the *Transactions of the American Surgical Association* (Philadelphia, W. J. Doran), edited by Dr. Archibald M'Laren, contains a valuable series of papers, many of which have already appeared in the current journals. In this form the value of the contributions is greatly enhanced by the publication of the discussion which followed the reading of the papers.

The twenty-third volume of the *Transactions of the American Pediatric Society* (Chicago, American Medical Association Press) contains a number of important papers on subjects connected with children's diseases. The majority of these centre round the problems of nutrition and metabolism ; poliomyelitis also occupied considerable attention at the last session of the Society. Many of the papers have already appeared in special journals, but all are worthy of re-issue in this interesting volume.

The new volume of *Transactions of the College of Physicians of Philadelphia*—the thirty-third of the third series—contains the papers read before the College from January 1911 to December 1911 inclusive.

The various contributions, covering a wide field, are chiefly of medical interest.

ANALYTICAL REPORTS.

Tabloid Morphine Hypophosphite. Tabloid Digitalin (Crystalline). Paroleine Spray Compound. Adjustable Head Dressing.

(Burroughs Wellcome & Co.)

Messrs. Burroughs Wellcome & Co. have added to their list "*Tabloid*" *Hypodermic Morphine Hypophosphite*, in products of four strengths—$\frac{1}{4}$ gr., $\frac{1}{3}$ gr., $\frac{1}{2}$ gr., and 1 gr. Morphine hypophosphite is a salt possessing qualities which render it particularly suitable for use in hypodermic medication when a concentrated solution is desired. It is perfectly stable, is practically neutral in reaction, and has the remarkable solubility of 1 in 3 of water. In clinical use its great solubility is a point of decided value, and it has been found to act well and promptly, without causing pain at the point of injection.

Tabloid Digitalin (Crystalline), gr. $\frac{1}{250}$, contains the most active of the glucosides obtained from digitalis leaves. It is a much more potent preparation than amorphous digitalin, and on this account its administration must be carefully watched. The indications for its use are the same as for digitalis, and it has been found to be efficacious in cases in which comparatively large doses of amorphous digitalin have failed. It corresponds to the German digitoxin.

The Paroleine Spray Compound contains menthol, chlorbutol, and "eucalyptia" in a basis of paroleine, and is admirably adapted for application as a spray to the nose or throat. In catarrhal conditions of the respiratory tract it has been found useful for its sedative, analgesic, and antiseptic effects. The substitution of chlorbutol for cocaine as the anaesthetic ingredient obviates the danger of inducing a drug habit from the use of the preparation. It is conveniently used in the "Paroleine Atomiser" issued by the manufacturers.

The *Adjustable Head Dressing* Tabloid Brand) is a convenient adjunct to the emergency bag of the practitioner. It consists of a light cap to fit over the head, with a tail which is carried round the back of the head, across the forehead, and back to the starting-point, where it is secured by a safety-pin. It can be adapted to a wound on any part of the head, and has advantages over an ordinary roller bandage, in that it is more easily applied, remains in position more securely, and is more comfortable to the patient. A pad of double cyanide gauze and a safety-pin are supplied in each package.

Pellidol. Azodolen. Novatophan.

(A. & M. Zimmermann.)

These preparations have been put upon the market with a view to overcoming some of the disadvantages associated with the use of scarlet red ointment.

Pellidol possesses no colouring properties, and any stain of the skin or linen may be removed with soap and water. It is easily soluble in fats and oils, as well as in ether, alcohol, etc., but is absolutely insoluble in water. Pellidol ointments therefore require only a small percentage of concentration to ensure efficiency of action.

Azodolen is a mixture of equal parts of pellidol and iodolen, thus combining the stimulating epithelial action with that of an antiseptic. The entire product possesses 30 per cent. of available iodine.

Novatophan is an improved form of atophan, which has been used with considerable success in the treatment of various diseases due to disturbed uric acid metabolism. Among other advantages, the new preparation is tasteless.

THIOMEL.

(THE S. P. CHARGES Co.)

This is an ointment containing sulphur in a combined and dissolved form, as well as in suspension. It is more active than the ordinary B. P. sulphur ointment. It does not stain the skin. The indications for its use are the same as those for sulphur ointment.

DORIFORM.

(E. W. BLASUIS.)

Some months ago we expressed a favourable opinion of a substitute for iodoform issued under the name of "Novoform." The manufacturers request us to state that, owing to difficulties in connection with the registration of the name "Novoform," they have been compelled to abandon the use of this word. The preparation is now registered under the name "Doriform."

BOOKS RECEIVED.

CAMMIDGE, P. L. Glycosuria and Allied Conditions . . . . *(Edward Arnold)* 16s.

DE LEE, J. B. The Principles and Practice of Obstetrics . . *(W. B. Saunders Co.)* 35s.

DOTY, A. H. The Mosquito . . . . *(Appleton & Co.)* 2s.

GIFFEN, G. H., and J. DUNDAS. Students' Manual of Medical Jurisprudence and Public Health. Third Edition . . . . *(Wm. Bryce)* 5s.

HAMMAN, L., and S. WOLMAN. Tuberculin in Diagnosis and Treatment *(Appleton & Co.)* 12s. 6d.

HERMAN, G. E., and R. D. MAXWELL. Diseases of Women. Fourth Edition *(Cassell & Co.)* 25s.

KEITH, ARTHUR. Human Embryology and Morphology. Third Edition *(Edward Arnold)* 15s.

KEMP, R. C. Diseases of the Stomach, Intestines, and Pancreas. Second Edition
(W. B. Saunders Co.) 28s.

LOVETT, R. W. Lateral Curvature of the Spine and Round Shoulders . *(Rebman, Ltd.)* 7s. 6d.

LUCIANI, L. Human Physiology. Vol. II. Translated by F. A. Welby *(Macmillan & Co.)* 18s.

PRICE, J. A. P. Hoblyn's Dictionary of Medical Terms. Fifteenth Edition *(Bell & Sons)* —

REILLY, T. F. Building of a Profitable Practice . . . . *(J. B. Lippincott Co.)* 10s. 6d.

REYNOLDS, S. H. The Vertebrate Skeleton. Second Edition *(Cambridge University Press)* 15s.

SMITH, F. J. Law for Medical Men . . . . *(J. & A. Churchill)* 10s. 6d.

THE Prescriber. Vol. VI. 1912. Edited by T. Stephenson
(The Prescriber Offices, Edinburgh) —

TRANSACTIONS of the American Surgical Association. Vol. XXX. 1912
(Dornan, Philadelphia) —

WOOD, E. J. A Treatise on Pellagra . . . . *(Appleton & Co.)* 16s.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL NOTES.

The Astor Report on Tuberculosis.

THE leading features of the final Report of the Departmental Committee on Tuberculosis are the prominence it gives to infection with bovine tuberculosis, and its insistence on the organisation of research. Pulmonary tuberculosis and its control was the theme of the interim report issued about a year ago, and in the present document there remains little to be said on the subject, save that the Committee are now more than ever strengthened in the conclusions then propounded.

The paragraphs of the Report which refer to the communicability of tuberculosis by milk, and the dangers which the community, especially juveniles, thereby incur, are perhaps the strongest pronouncements on the subject which have appeared in any official paper. They do not, however, err on the side of overstatement, and it is probable that if the researches which are now going on in Edinburgh had been sufficiently advanced to have been brought more clearly under the notice of the Committee, the Report would have gone further than to say that " in a few cases the source of infection has apparently been traced to a particular milk supply." The Report, however, does not shirk the logical conclusion : it contemplates as not impossible " the ultimate eradication of animal tuberculosis " : it recognises that for this no single or local effort will suffice ; and it emphasises the necessity for attending to the safety of milk during the time which must intervene before cattle are freed from tuberculosis. In the stamping out of bovine tuberculosis a uniform system of inspection, tuberculin testing, and slaughter of tuberculous animals are imperative : the public must be awakened to insist on tubercle-free milk, and farmers must be taught that the disease is not hereditary, but infectious, among stock.

An important section of the Report shows how necessary is the special provision of hospitals and sanatoria for surgical tuberculosis in children, with, as an added curativ agencye, a wider application of the principle of open-air classes and schools. In this direction the school medical officer should link up the family and the family doctor with the tuberculosis officials, since some of the curative agencies

mentioned naturally fall within the province of the education authorities. We heartily agree with the Committee's *dictum* that separate institutions are required for children, and that non-pulmonary tuberculosis, for the most part surgical, should be under special administration in specially equipped sanatoria and hospitals. Of this part of the Report it may be said that there is complete recognition of the fact that tuberculosis begins in childhood, and that to check it in a community it is not enough to deal with adults or with pulmonary tuberculosis.

Research on a large scale is contemplated. Under the Insurance Act there should be available for this £57,000 a year, which in itself marks an epoch in the history of the State in relation to scientific medicine. The inquiries to which this fund might, it is suggested, be applied, extend beyond the purely pathological into the fields of sociology and statistics. It is matter for congratulation that the Committee deprecate and discourage any scheme of centralising all the work in one great institute : they advise that it should be carried on wherever the greatest facilities for any particular investigation exist. In this way work will be stimulated all over the country. The general direction of research and the co-ordination and publication of results are placed in the hands of a special advisory council, with a technical executive committee and a well-paid expert as secretary. As a general plan of operations it is suggested that a central bureau be established as the headquarters of the council and committee, with statistical and sociological departments in touch with the other Government statistical departments. The bureau would also house the library, and be the publisher of the collective investigations. Secondly, clinical and other strictly pathological researches in approved institutions would be undertaken, including special researches in hospitals and laboratories under the immediate control of the executive. Thirdly, statistical and sociological inquiries by the executive, independently of any institution. Fourthly, the furtherance of discovery by the award of substantial prizes. When it is considered how far reaching have been the results of private or voluntarily endowed research, it is permissible to be sanguine that still greater progress will be achieved when the State gives financial aid. The day is quickly passing when knowledge can be advanced by simple experiments and home-made apparatus : nowadays science demands the most elaborate and costly equipment, and lack of this places a worker at hopeless disadvantage. The frank recognition by the State that research must be endowed is a hopeful augury, not only for the present study of tuberculosis, but for all preventive medicine in the future.

The natural corollary to any serious scheme for tackling non-pulmonary tuberculosis is notification : like phthisis, non-pulmonary tuberculosis must be compulsorily notifiable. The Local Government

Board has already issued regulations to this effect, and the Scottish Board is understood to be contemplating a similar step.

To Edward VII. is ascribed the saying: "If preventible, why not prevented." The Reports of the Astor Committee dot the i's and cross the t's of the apothegm.

The Spirochæta Pallida and the Wassermann Reaction in Obstetrics.

THE importance of syphilis in all branches of medicine needs no emphasis, and especially in obstetrics it has always attracted the greatest attention.

Before the discovery of the spirochæta pallida and of the Wassermann reaction one relied for the diagnosis of syphilis in pregnant women and their offspring on the fact of repeated abortions in the affected women and the increasing lateness in term of the catastrophe, while in the dead fœtus the macerated condition and the presence of Wegner's osteochondritis of the humerus with liver changes were held, *inter alia*, to give ample grounds for specific diagnosis. In the living child the skin eruptions and nasal and nates conditions usually made the syphilitic condition evident. The placenta of such cases, usually larger than in a healthy pregnancy, showed a swollen condition of the villi and a proliferation condition of their connective tissue.

In connection with the woman, pregnant and with syphilis, some striking and apparently contradictory conditions came out. She herself might have apparent syphilis, but more often it was found that she seemed free from it, but suffered from a series of abortions of a syphilitic nature—Fournier's syphilis by conception. If such a mother had a living child, it was held by Colles' law that it would not infect her if she nursed it, although capable of infecting a healthy wet nurse.

In selecting a wet nurse for a healthy child the obstetrician had to be on his guard lest the former had an old and clinically latent syphilis and in the case of a mendacious applicant he might be sorely and disastrously misled. In treatment, mercury was the only remedy employed in the case of mother and child, and often with brilliant results.

The great work of Schaudinn and Hoffmann, of Wassermann and others, and of Ehrlick have, however, completely changed this, and made syphilis in the pregnant mother and in her child a matter of accurate recognition, and not of somewhat hesitating diagnosis. To this may be added that we have now attained a comprehension of the subject, which cannot fail to lead to further advances. The *spirochæta* can now be easily detected in the syphilitic placenta, in the syncytium and core of the villus, in the placental circulation, and in the muscle of the vein walls of the cord. In the congenitally syphilitic fœtus Dr. Hans Bab, in 1907, gave a list of 50 organs or tissues in which it had

been demonstrated, a real spirochæte sepsis and a striking contrast to the meagreness of its presence in gynæcological disease.

The Wassermann reaction has shown that in Fournier's syphilis-by-conception cases there is a positive reaction, and thus that in such the woman is really syphilitic. Colles' law is thus not absolute. The value of the reaction in selecting a wet nurse is evident, although it is not absolutely certain, the reaction being given in some other diseases. Salvarsan has the great merit of rapid action, and thus its promising future in early syphilitic pregnancy and in syphilitic women nursing their own children, where the treatment of the mother has, through the milk, benefited the child.

Enough has thus been said to show how obstetrics and pediatrics have benefited from the work of the illustrious investigators quoted, and it is further of importance to note finally that such great advances have been brought into these practical branches by scientific investigations in parasitology and immunity, subjects which, on a narrow and superficial consideration, might not seem to have much direct bearing on them.

The late Dr. Kirk Duncanson.

WE regret to record the death of Dr. J. J. Kirk Duncanson, a well-known member of the medical profession in Edinburgh. Although he had retired from active practice for some years, Dr. Kirk Duncanson maintained his interest in medical affairs to the end, and his was always a welcome presence at any gathering, social or scientific.

For many years he was one of the leading specialists in diseases of the ear, and was largely instrumental in founding the Ear Department in the Eye, Ear, and Throat Infirmary, Cambridge Street, to which institution he was attached as surgeon for the long period of thirty years. Dr. Kirk Duncanson was a man of many and varied interests, and an accomplished linguist. In his younger days he took a prominent part in the Volunteer movement, and attained to the rank of Surgeon-Lieutenant-Colonel (V.D.) in the 1st Edinburgh City Volunteer Artillery. For long he contributed to the *Journal* abstracts, summaries, and reviews of foreign medical literature, as well as original articles on his own subject. Those who had the pleasure of his friendship will long cherish the memory of his handsome presence, his courtly manner, and his genial, warm-hearted kindliness.

Appointments.

Dr. H. M. TRAQUAIR has been appointed Assistant Ophthalmic Surgeon to the Royal Infirmary. Dr. H. L. Watson Wemyss has been appointed Assistant Physician to Leith Hospital.

GENERAL PARALYSIS OF THE INSANE:

BEING

THE MORISON LECTURES, 1913.

By GEORGE M. ROBERTSON, M.B., F.R.C.P.,

Physician-Superintendent, Royal Asylum, Morningside, and Lecturer on
Mental Diseases, University of Edinburgh.

I.

THE EARLY DIAGNOSIS OF GENERAL PARALYSIS.

GENERAL paralysis is common in our large cities, and assumes so many disguises that it is necessary to be ever on the alert for it. About a third of the male admissions to asylums between the ages of 35 and 50 suffer from it, and the possibility of its presence should always be remembered in the case of a man of this age presenting mental symptoms. Such men are usually the heads of families, and occupy positions of responsibility, for as a rule those who suffer from general paralysis are no weaklings. The social troubles and inconvenience produced by the occurrence of adolescent or senile insanity, bad as they may seem, are therefore trivial compared with those produced by a disease such as this, which attacks the breadwinner of a family and the head of a business in the prime of his life.

A feature of general paralysis which adds to the anxiety of relatives is the alteration of character without any obvious sign of insanity, which is often one of its early symptoms. A man whose sanity is not yet questioned scandalises his neighbours and ruins his good name by his conduct in public places, or he dissipates his means and brings his family to want by senseless extravagance or by muddling his affairs.

Nothing more need be said to indicate the value of an early diagnosis of this disease, yet it often goes undiagnosed. Till within the last five years the diagnosis, even when well-marked symptoms were present, was not infrequently in error, and in the early stage of the disease suspicion may have been justified, but a definite diagnosis never was. The anxiety produced by this uncertainty was often very trying, and when important matters are at stake it has been found so intolerable that the skull has been trephined and a small portion of the cortex removed and examined microscopically, to settle the question one way or another.

This *uncertainty of diagnosis* was well illustrated by the 54 cases upon which Wassermann and Plaut first started their

syphilitic investigations, when the one thing they desired was clinically certain material from the institutions of Berlin and Munich. They were informed that " no doubt of the diagnosis of paresis could exist," for the cerebro-spinal fluid came from cases almost all of which were in the " undoubted advanced" stage of the disease, or were " ordinary straightforward cases " of " clinically undoubted" general paralysis. In spite of every precaution three cases of mistaken diagnosis were found after death in the 54 cases, an error of nearly 6 per cent.

A most instructive investigation into this subject was made a few years ago in America by Southard. He followed to the post-mortem room and the laboratory 41 well-marked cases in which the entire medical staff of an asylum had unanimously agreed on clinical grounds that the diagnosis of general paralysis was certain. He found on examination after death that there were 6 errors of diagnosis in the 41 cases, or 15 per cent. From my own experience I am certain that this is not an over-estimation, and if an attempt were made to diagnose not merely well-marked but also early cases and those showing slight clinical phenomena the error would be much greater.

Caution was recommended by the most experienced physicians of the past, and they pointed out that as the diagnosis of general paralysis was tantamount to passing sentence of death on the patient, every other possibility should be excluded before coming to this conclusion. Much likewise required to be excluded, for there were at least ten other conditions from which a differential diagnosis might have to be made. These included alcoholic and syphilitic insanity, senile insanity, and organic brain disease with paralysis, traumatic insanity, certain toxic conditions and neurasthenic states, epilepsy, mania, and imbecility. It was often impossible to arrive at a definite diagnosis, and this was especially the case with certain forms of alcoholic insanity resembling the confusional psychoses of Korsakoff. A provisional diagnosis only could be made, and the course of the disease watched, for any other policy sooner or later led to most regrettable mistakes. In cases of organic brain disease with paresis similar mistakes were also liable to occur. Neurasthenic states in middle-aged men who had been exposed to infection from syphilis often gave great anxiety, and in doubtful senile cases above 64, owing to difficulties and uncertainties, a diagnosis of general paralysis was seldom made.

The methods of investigating general paralysis have now been

revolutionised, and its diagnosis has been placed on a sure basis by the six new serum and spinal fluid reactions and tests. The method of diagnosing it now consists of two processes which are complementary. There is first the clinical process in which the patient is examined by the usual methods employed in psychology and neurology. If, as a result of this examination, the presence of general paralysis be suspected, it is then necessary to apply the second or laboratory process, to verify this first impression. The employment of the latter resembles chemical analysis in the method of its application and in the certitude of its results. By obtaining certain definite reactions in sequence and noting the presence of certain positive signs in association with the clinical symptoms, an accurate diagnosis can almost always be made. There are only two conditions in which there is any uncertainty with regard to the presence of general paralysis, namely when mental symptoms exist in association with its twin sister, tabes, or its first cousin, cerebro-spinal syphilis.

It is not my intention to give a description of the classical symptoms of general paralysis, as these can be found in any text-book. My object is rather to arouse suspicion of the presence of the disease at an early stage by drawing attention to those symptoms, often not serious in themselves, which appear early. In the past such suspicions would have been futile had they arisen, for nothing further could have been done to complete the diagnosis but to await developments. Now we can apply the laboratory tests referred to, and in almost every case say definitely and at once whether general paralysis be present or not.

Mental Symptoms.

The fundamental symptom of general paralysis is enfeeblement of function. There is a steady process of deterioration going on, producing first impairment and finally destruction or paralysis of the mind, known as dementia. Weakness of judgment, loss of memory, and a blunting of the sensibilities are present in one shape or another in every case, and these are the characteristic symptoms. In the early stages the patient is not insane, he is merely a changed man. There is an alteration in his intelligence, character, habits, and feelings, and this change is for the worse. He may continue to do his work, though in a more mechanical and less efficient way than before, and it costs him a greater effort. Forgetfulness is usually a noticeable symptom, and failure of memory may lead to unexpected mistakes in spelling and calcula-

tion, but there are also more serious lapses when important matters are forgotten. Lifelong habits of courtesy, of decent behaviour, and of personal honour may be departed from, and in their place there may arise a tendency to alcoholism, immorality, or even criminal acts, such as absurd theft. Moodiness and irritability may develop, or else apathy and indifference. It is said that 12 per cent. of the cases are conscious of these defects, but it is probable that at this early stage the percentage is really very much higher.

It is only possible to illustrate this mental change by a few concrete examples. The weakened judgment, which, with failure of memory, is the most characteristic early symptom of general paralysis, is best shown by the conduct. The experienced man of business makes foolish investments for which no tyro could be excused; the careful man makes numerous purchases of useless articles, or presents gifts which he cannot afford to strangers; the clerk's book-keeping is muddled, and his ledgers are full of errors and miscalculations; the considerate parent will grab the food on the table and eat to excess, regardless of his family; the working man's wife will meet her husband with a smiling face, but with no explanation to give why his dinner has not been cooked for him; the particular man neglects his personal cleanliness and dresses carelessly or absurdly; the owner of a motor-car drives so fast that no one will enter his car. He knocks down a child, and not only does not stop to see if it has been injured or not, but does not worry about it. A golfer, playing in a mixed foursome, stands aside from the teeing-ground and urinates openly. Loss of control over the temper in a man not naturally hot-tempered is a frequent symptom. At tennis, billiards, or cards, unless he wins, he is unbearable, and makes unpleasant scenes. He will not scruple to take a mean advantage at these games, or even to cheat. All these symptoms can be traced to a loss of the better judgment, of the finer feelings, and of memory, and though they do not amount to actual insanity, they nevertheless indicate a serious deterioration of intelligence and character from the normal, which, if associated with any of the physical signs of general paralysis, should not be overlooked.

These occasional mental failings may exhibit themselves for a period of a year or more before serious and continuous signs of mental disorder become superadded. Sooner or later a state of confusion, depression, excitement, or only hypochondriacal neurasthenia develops, and the patient is recognised to be mentally

affected. Not infrequently the presence of general paralysis is unsuspected at first, especially if the patient be melancholic, which he is more frequently than is thought. These superadded phenomena mask the fundamental symptoms of deterioration to which I have alluded, but the expert, especially if he has had his suspicions awakened by a pupillary anomaly or by a knowledge that the patient has had syphilis, can usually detect them. There is often, but not always, something atypical in the mental disorder. The paralytic melancholic may thus take his food ravenously, or may sleep soundly, or may make silly remarks, or show great loss of memory, none of which are features of typical melancholia.

PHYSICAL SIGNS.

There are mental symptoms so typical and characteristic of general paralysis, like the absurd and grandiose delusions of the second stage, that they at once suggest that disease. Those I have just described may be due to other causes, and they only suggest general paralysis if they are associated with the physical signs of that disease. It is this combination of mental symptoms with physical signs which is so ominous and important. As general paralysis may attack any part of the nervous system, any physical sign or symptom known to neurology may be present, but the disease shows a selective power, and certain symptoms are more common than others. Generally speaking, it may be said that these early physical signs are those which are also found in tabes; but any neurological sign, such as a convulsive seizure, a temporary aphasia, or an attack of unconsciousness, may give warning of the onset of the disease.

The pupils in general paralysis are usually unequal, but unless very marked this sign is of no diagnostic value, owing to its prevalence. The outline is frequently uneven or irregular, and if markedly so this has more diagnostic value. It may, however, be congenital or be due to syphilitic adhesions, and I have seen extreme temporary irregularity of both pupils due to toxic conditions.

The most important diagnostic sign is the fully developed *Argyll-Robertson phenomenon*, or complete loss of the light reaction in one or both eyes. This symptom is regarded by Babinski and Gowers as a definite sign of antecedent syphilis and as a warning of the danger of tabes or general paralysis. It may occur in rare organic lesions, but these are not likely to be confused with either of those diseases. It is a most valuable

phenomenon due to the selective action of a particular toxin on certain nerve-cells and fibres, the exact position of which is still a matter of doubt. It is not always due to actual degeneration, as the phenomenon may come and go from time to time.

It has an early or incomplete stage, as Argyll Robertson pointed out in his original paper in 1869, in which the light reaction is not abolished but is only delayed or sluggish. Thus in a patient when first diagnosed to be suffering from general paralysis a sluggish reaction of the pupils was obtained, while later on, as the attack culminated, the reaction became totally abolished, the change taking place during the course of one night. As the acute symptoms passed off six weeks afterwards the reaction returned, but was still sluggish. The reaction may be present in one eye only, or be in the early or incomplete stage in one eye and in the advanced or complete stage in the other. It is not difficult to distinguish this sluggish reaction from the normal, as the necessary skill is soon acquired after seeing a few cases, especially if a case be studied in which there is one normal eye for the purpose of comparison. The normal contraction is stated to last about one-fifth of a second, and the sluggish reaction probably lasts twice as long. While the complete Argyll-Robertson phenomenon is almost always a post-syphilitic sign, sluggish reaction of the pupils of a temporary nature is frequently observed in alcoholic and other conditions.

The Indirect Light Reflex.—The light reflex should be tested with different degrees of illumination, and the best results are not got in a bright light. If the pupils be contracted, as sometimes happens in general paralysis, but not so frequently as in tabes, it may be difficult to get satisfactory results under any conditions. The most delicate method of testing for the presence of the Argyll-Robertson phenomenon is the test for the indirect or consensual light reflex. This is performed by fixing open the lid of one eye with the thumb and watching the pupil of that eye attentively, while with the other hand the other eye is alternately opened and closed. This method of examination possesses two advantages—it enables the pupil to be very closely and continuously observed without any interruption from the process of alternate illumination and shade, so that the quickest and slightest movement cannot possibly escape detection ; it also applies a feebler light stimulus for the purpose of eliciting the reflex than the direct reflex does, and failure is therefore more likely to occur if the pathway be

obstructed. The afferent fibres in the optic nerves conveying the light stimulus decussate in the chiasma in the same way as the visual fibres. They possibly do not decussate equally (Oppenheim), the smaller bundle crossing over, for if a bright light be made to shine in one eye it will cause a greater direct contraction of that eye than a consensual contraction of the other eye. Unequal intensity of the stimulus is undoubtedly an important factor in the production of the Argyll-Robertson phenomenon, for the greater intensity of the stimulus which actuates the accommodation reflex is the explanation which is usually offered for the retention of the accommodation reflex, while the light reflex is lost. A sluggish contraction may thus be obtained by the indirect method of testing in the earliest stage of the Argyll-Robertson phenomenon, while the reaction still appears to be normal by the method of direct illumination.

According to these views there are three stages of the Argyll-Robertson phenomenon or loss of the light reflex :—

1. A sluggish indirect reflex.

2. A sluggish direct reflex with a more sluggish or absent indirect reflex.

3. Abolished direct and indirect light reflexes.

Sluggish light reflexes are far more commonly met in the early stage of general paralysis than the complete Argyll-Robertson phenomenon, but the latter may precede the development of general paralysis by many years, although this experience is not so common as in the case of tabes. A sluggish or abolished light reflex is present in 70 per cent. of the cases of general paralysis (Franz). They are therefore signs of primary importance on account of their frequency alone, and in their absence a diagnosis must be made with caution.

Bevan Lewis records the opinion that the loss of the sensory reflex, a dilatation produced by pain as from the prick of a pin near the eye, is the earliest pupillary symptom in general paralysis. This reaction varies in normal persons, and the application of the test is more open to error than that of the indirect light reflex.

The Knee-Jerks.—In 75 per cent. of the cases of general paralysis the knee-jerks are either exaggerated or else sluggish or absent (Franz). These two abnormal reactions do not have the same diagnostic value, for exaggeration, unless very marked, occurs in so many nervous conditions, that it does not point specially to general paralysis. It is different, however, with

the sluggish or abolished reaction, which occurs in nearly a third (28 per cent.) of the cases of general paralysis. It is very significant of that disease or tabes, and like the incomplete Argyll-Robertson phenomenon it is often an early symptom.

The examination must be carefully made, and the attention of the patient should be distracted by directing him to look upwards at some object and by asking him a question, such as his age. The leg should be in a favourable position, with the foot on the ground, the knee flexed at a slightly obtuse angle, and a proper percussion hammer employed to strike the blow.

Valuable information can be gained by comparing the reactions, and in an early stage the one knee-jerk can be compared with the other, for only one may be found to be sluggish. At other times the knee-jerks may be compared with those obtained in the arms. Thus in one case my suspicions were aroused by eliciting an active radial jerk by percussing the end of the radius, while the knee-jerks were very poor. In all cases of sluggish knee-jerks the Achilles tendon should also be tested, and this can be very easily and conveniently done by asking the patient to kneel on a chair with one leg at a time, facing the back. It is sometimes found in these cases that the Achilles jerk is already absent, for it tends to disappear sooner than the knee-jerk. The longer the nerve fibre the more vulnerable apparently is the neurone to degeneration, hence these abnormalities appear earlier at the ankle than they do at the knee, and at the knee earlier than at the elbow. The examination of the Achilles jerk should therefore be a routine procedure.

The Speech and the Writing.—Both the speech and the writing are affected in general paralysis, but the latter is not of much diagnostic value as an early sign for many reasons. The standard of caligraphy varies greatly — even well-educated people may write badly—and much depends on the pen or on the environment at the moment. As a practical test it fails on the one hand because of nervousness, and on the other because by taking more time and care a patient suffering from early general paralysis may turn out better writing than his normal or average. These variations in writing can be studied by comparing the carefully written address on the envelope with the less careful writing in the letter itself, and the beginning of a letter with the signature at its end.

The disorders of speech are more important, and they can be more accurately tested by asking the patient to repeat words or phrases more and more quickly. Every person attains to a prac-

tical efficiency of articulation, but it is possible by combining syllables together which are awkward to pronounce, and by urging him to speak faster and faster, to reach a stage when blunders will necessarily occur with all. In testing the articulation in general paralysis this must be remembered, and the tests should not be made too severe, or they fail in their object. The pronunciation of the labials and the linguals should be separately tested, as in the early stages the defect is usually limited to one or other. For the labials the words "Hippopotamus" or "Hopping Hippopotamus" repeated three times quickly are sufficiently discriminating, and for the linguals "British Constitution" or "Third Territorial Artillery" will serve.

In making these tests the examiner should repeat the form of words at the same pace as he demands from the patient. He must remember that in states of exhaustion and neurasthenia defects of speech may be elicited, that dental plates or missing teeth, and parched lips or tongue, are a handicap to articulation, and that this function may be affected by nervousness.

In the early stages of general paralysis the errors that may occur are of two kinds, either a stumbling and stopping at a letter or a missing and passing over of a letter. By the first blunder a syllable may be repeated once or twice, as, for example, " Hip-pip-pip-Potamus," and by the second the syllables are slurred or run together, as, for example, " Bri'sh Const'ution." In other cases the speech is only less facile and slower. At this stage the high-pitched and tremulous intoning speech has not yet developed.

Facial Expression.—When the patient speaks tremor of the lips may be noticed, but this may be only emotional in origin. Tremor of the tongue may also be present, but this symptom occurs in so many nervous and toxic conditions that it is not of much diagnostic value. Of more value is the expression of the face, which is often heavy, immobile, or mask-like at a comparatively early stage. The natural and ceaseless play of the muscles of expression, which accurately reflect every variation and phase of mental feeling, is lost or much diminished, a condition termed amimia. This stiff and expressionless look, of the lower part of the face chiefly, is often associated with labial defects of the articulation.

LABORATORY METHODS.

If some, but not necessarily all, of these physical signs relating to the expression, articulation, knee-jerks, or pupils, and of these the last are the most important, be found associated with mental

symptoms indicating deterioration, such as failure of memory, impairment of judgment and moral laxity, and especially if these occur in a man of middle age who has had syphilis about ten years previously, then general paralysis should be suspected. The case should now be submitted to laboratory methods for the application of the six new serum and cerebro-spinal fluid tests, in order that the diagnosis may be confirmed and certainly attained. In the first place 5 c.c. of blood drawn off by venepuncture should be sent to a thoroughly reliable serologist to test for the Wassermann reaction.

Negative Reaction in the Serum.—If the Wassermann reaction in the blood serum be found to be negative, general paralysis can be almost certainly excluded, for in experienced hands a positive reaction is obtained in 99 per cent. of the cases of general paralysis. In those cases in which the clinical symptoms are few and indefinite, and mere suspicion of general paralysis existed, this negative result is sufficient to allay suspicions, and further examination need not be made.

Negative Reactions in Serum and Spinal Fluid.—In those cases, however, in which the clinical symptoms are numerous or fairly typical of general paralysis, lumbar puncture should next be performed, and 5 c.c. of spinal fluid withdrawn. If the Wassermann reaction be negative in the spinal fluid as well as in the blood serum, then general paralysis may now, with almost absolute certainty, be excluded in spite of the clinical symptoms. One of my cases of stationary but undoubted general paralysis, which had lasted 12 years, gave, however, a double negative Wassermann reaction.

Positive Reaction in Serum and Negative in Spinal Fluid.— In those cases in which a positive reaction has been found in the blood, proof of latent syphilis has been obtained, and lumbar puncture must always be performed. If the reaction in the spinal fluid be then found to be negative, the case is one of mental symptoms in a person who has had syphilis, but whether these symptoms be due to cerebral syphilis or not can only be decided by a clinical study of the case. In 6 per cent. of the cases, however, a negative reaction has also been obtained in the spinal fluid in general paralysis, so the other tests should be applied and further close study of the clinical symptoms made to exclude it.

Positive Reactions in Serum and Spinal Fluid.—If the reaction in the spinal fluid as well as in the blood be positive, then the

case is either one of general paralysis, or of tabes with mental symptoms, or of syphilis of the nervous system with mental symptoms, or of any two or all of these three conditions in combination. By far the most probable diagnosis, however, is general paralysis, for while the positive reaction in the cerebro-spinal fluid is obtained in 94 per cent. of all cases of general paralysis, it is obtained in 53 per cent. of tabes (Bayly) and in only 17 to 50 per cent. of syphilis of the nervous system (Bayly, Henderson).

Negative Reaction in Serum and Positive in Spinal Fluid.—Whether the reaction in the serum be positive or negative does not matter, if a positive reaction has been obtained in the spinal fluid. The latter is the paramount sign, and even alone definitely indicates an involvement of the nervous system by one or more of the three diseases mentioned. The greatest use of the blood test is not to give confirmatory evidence but to avert the necessity of lumbar puncture in those cases in which the blood is found to have a negative reaction. It has, however, already been stated that a negative reaction is obtained in the blood serum in 1 per cent of cases of general paralysis, with (and in one very chronic case without) a positive reaction in the cerebro-spinal fluid.

Lymphocytosis.—The cytological examination of the spinal fluid must next be made, and if a lymphocytosis be present in association with a positive Wassermann reaction of the fluid, it confirms the previous diagnosis that the nervous system is involved by one of the three diseases mentioned. If a definite lymphocytosis be absent it does not negative the presence of general paralysis, as it is known to be absent in 10 per cent. of the cases; moreover the absence of lymphocytosis is against the diagnosis of cerebro-spinal syphilis, where the cell count is usually very high.

If the Wassermann reaction in the spinal fluid has been negative, but in the blood positive, and a lymphocytosis is found, this combination usually points to syphilis of the nervous system, but it may occur in 6 per cent. of cases of general paralysis, and the differential diagnosis of these two conditions in this percentage of cases must be made on clinical evidence.

Globulin, Albumin, and Plasma Cells.—The three minor tests are the excess of globulin demonstrated by means of a saturated solution of ammonium sulphate (the Ross-Jones test), the presence of over 0·1 per cent. of albumin tested by Aufrecht's albuminimeter, and the presence of plasma cells in the cell count. These tests confirm the results of the three major tests, or in the absence of these

confirm a provisional diagnosis of general paralysis made on the strength of the clinical symptoms.

Summary.—By means of the positive Wassermann reaction of the spinal fluid general paralysis can be differentiated from every other condition which simulates it but tabes and syphilis of the nervous system, and the other five tests assist very little in the differential diagnosis of these three conditions, which must be made on clinical grounds. The necessity for the exact study of the clinical symptoms of these diseases is now not less but more necessary than ever, and a short account is therefore added of the chief diagnostic features of tabes and cerebral syphilis with mental symptoms.

Tabes with Mental Symptoms.

According to Dr. Byrom Bramwell's statistics 11·4 per cent. of tabetics pass into general paralysis, and it is computed that at least one-third of the cases of general paralysis present tabetic signs. Excluding these cases of tabo-paralysis it is found that persons suffering from pure tabes seldom present mental symptoms, and it is notorious that many intellectual and distinguished men have been afflicted with this disease.

If tabes occurs in a member of a neurotic family the patient will be subject to the same neuroses and psychoses as his relatives, and, if he be alcoholic, to alcoholic insanity. In such cases neurasthenia is common, and gives rise to some anxiety, as it is difficult to differentiate it from the early neurasthenia of general paralysis. Certain forms of alcoholic insanity may also cause anxiety by simulating general paralysis, but they may also mask its development.

There are, however, three types of mental disorder which seem to be specially associated with tabes :—

1. An insanity of persecution, with more or less systematised delusions and irritability.

2. A mild melancholia, with hypochondriacal fancies and some enfeeblement. The delusions in these two types are possibly founded on the lightning pains.

3. Lastly, in some old-standing cases a mild degree of dementia may develop, associated with an emotional condition of either indifference or optimism.

In some of these cases the lesions of general paralysis have been found in the brain, but in others, including two cases examined by Alzheimer, they were not found.

The appearance of mental troubles in a tabetic ought always

to awaken the suspicion of general paralysis, especially if accompanied by signs of confusion, of mental weakness, and of loss of memory, and in which the deterioration is progressive. The development of speech difficulties and of a heavy, mask-like expression of the types characteristic of general paralysis are ominous physical signs. It is believed that the tendency to pass into general paralysis is greater in the early years of tabes than after the disease has existed many years.

With regard to the Wassermann reaction and the other reactions and signs, while these may be exactly the same as those obtained in general paralysis, they are not nearly so constant. The Wassermann reaction is obtained in the serum in about 60 per cent. of the cases, and in the cerebro-spinal fluid in about 50 per cent. (Bayly). These low percentages as compared with the 99 and 94 per cent. in general paralysis probably indicate that the disease is not so extensive nor so active. I also express the opinion with some diffidence that in a considerable proportion of mild cases the activity of the disease process diminishes, and may cease altogether. I would thus account for the existence during a lifetime of solitary symptoms like optic atrophy, the Argyll-Robertson phenomenon, or the loss of the knee-jerks, and for those stationary cases which give a double negative Wassermann reaction. The continuation of the pains and other symptoms in these cases is possibly not due to any active disease but to the organic changes which have already taken place. Treatment also, while not influencing the organic changes, has according to Boas a definite effect on the Wassermann reaction in rendering it negative in about one-half of the cases, and very often in the early stages the symptoms are ameliorated. In the nature of its response to salvarsan treatment, tabes occupies an interesting position, midway between general paralysis and cerebro-spinal syphilis.

CEREBRO-SPINAL SYPHILIS WITH MENTAL SYMPTOMS.

Cerebral syphilis with mental symptoms may simulate general paralysis so closely as to make the differential diagnosis an impossibility during life. The 9 errors of diagnosis in Plaut's and Southard's 95 cases were chiefly due to this cause, which includes gumma, meningitis, and endarteritis, both of the large arteries and the terminal vessels—the so-called Heubner's and Nissl's types. There is little doubt also that most of the supposed recoveries from general paralysis have been cases of cerebral

syphilis. On the other hand general paralysis may be complicated by the presence of focal lesions which may simulate those of cerebral syphilis. The distinctive lesions of the two conditions have also been found combined after death, and a number of cases have been reported in which the patient first presented symptoms of cerebral syphilis, and subsequently developed general paralysis.

The mental symptoms do not help materially in distinguishing certain cases of cerebral syphilis from general paralysis, and more reliance must be placed on the physical signs. These are more definitely localised in cerebral syphilis, and less diffuse or general. They usually appear more suddenly, and are more permanent than similar signs in general paralysis. The speech defects have not the distinctive character of the articulation in general paralysis, and are more often associated with ordinary aphasia. The Argyll-Robertson phenomenon is not usually present in cerebral syphilis, whereas ocular paralyses occur earlier and are more frequent. The history of the attack of syphilis in cerebral syphilis often shows it to have been a severe one, which is unusual in general paralysis. It usually develops much sooner after the infection, and may co-exist with other tertiary or even secondary manifestations. Of 228 cases of syphilitic hemiplegia Fournier found that nearly 40 per cent. (39·4) occurred before the end of the third year, while of 112 cases of general paralysis only one occurred during that period and only 4 per cent. before the sixth year, the majority occurring between the 8th and 12th years. Many persons suffering from cerebral syphilis, owing to its early development, are under 30 years of age, whereas few general paralytics are, unless those who suffer from congenital syphilis. Lastly, the effect of anti-syphilitic treatment is usually beneficial to the symptoms of cerebral syphilis, but not so of general paralysis.

In cerebral syphilis it is usual to find a positive Wassermann reaction in the blood, a negative reaction in the cerebro-spinal fluid, a very high lymphocytosis, and a moderate excess of globulin. In a number of cases, varying from 17 to 50 per cent. (Bayly, D. K. Henderson), a positive reaction is also obtained in the cerebro-spinal fluid. The reaction is most frequently obtained in recent cases, while in old-standing cases it may disappear not only from the cerebro-spinal fluid but from the serum as well, the active disease having apparently become extinct. These reactions and signs are influenced so greatly by treatment, in contrast to what obtains in general paralysis, that

this forms perhaps the most reliable diagnostic test of cerebral syphilis. The excess of globulin quickly disappears, the high cell count falls to a little above normal, and the positive Wassermann reaction usually disappears, first from the spinal fluid, and then from the serum. In cerebral syphilis the power of the spinal fluid to reduce Fehling's solution, which is present normally and in general paralysis, may be lost, but it returns under treatment (Kaplan, *Amer. Journ. of Insanity*, lxix.).

General Paralysis without Clinical Symptoms.

So far I have only considered the new reactions and signs as evidence which confirmed that of the clinical symptoms, and therefore as a subsidiary element in the diagnosis of general paralysis. Are they not the most important element, and would we not be justified in diagnosing the disease from their presence alone? They are present at a very early stage, exactly how early no one yet knows, and it is quite possible these reactions and signs may exist before there are noticeable clinical symptoms. There is nothing impracticable in their discovery under these circumstances, for everyone who is now infected with syphilis ought to have his blood examined for the Wassermann reaction, and if this be persistently positive, his cerebro spinal fluid should be examined too. If such a patient's blood and cerebro-spinal fluid gave a double positive Wassermann reaction, associated with lymphocytosis, plasma cells, albumen, and an increase of globulin, it would scarcely be possible, in my opinion, to avoid the diagnosis of general paralysis or tabes, even in the absence of any definite psychological or neurological symptom. The subsequent development in such a case of mental and nervous symptoms would be conclusive, and would confirm the diagnosis of general paralysis. It would be a very satisfactory result of the progress made in medicine if one could make such an early diagnosis before any symptoms of degeneration could be observed, and it might yet prove invaluable as regards treatment.

It is possible that in the future transient mental episodes and neurological phenomena resulting from latent syphilis may be noted, which may bear some relationship to and occupy some intermediate position to general paralysis, and be of a more benign character. *Formes frustes* may also be discovered, as has usually been the case with other diseases when our knowledge of them has become more accurate, but in the whole field of psychological medicine there is still not a more responsible problem, or one

requiring the exercise of more prudence and caution, than the early and definite diagnosis of general paralysis.

The Etiology, Prophylaxis, and Treatment of General Paralysis.

Etiology.—It is impossible to discuss the prophylaxis and treatment of general paralysis without disposing of the vexed question of its etiology, but the more this is investigated the more is one impressed by the mass of circumstantial evidence in support of the syphilitic hypothesis. A short résumé of this will be given.

Relationship to Tabes.—General paralysis and tabes have the same etiology, the facts relating to the one running an exactly parallel course to those of the other. Of a whole family infected with syphilis some members may develop one disease and some the other, and of several men infected from one source the same may be true. Souques reports a family where the father had general paralysis, the mother tabes, and two daughters tabes, and Moenkemoller a converse instance in which the father had tabes, the mother general paralysis, and a daughter general paralysis. Of five glassblowers mentioned by Brosius who simultaneously contracted chancre of the lip in their occupation, four ultimately suffered from tabes or general paralysis: and of four men infected by one woman, mentioned by Erb, all developed in time either tabes or general paralysis (Mott). The two diseases may develop together or in sequence in the same subject, forming tabo-paralysis. They are similar diseases, differing chiefly in the locality, in the extent, and in the intensity of the disease process, and evidence relating to the etiology of the one is applicable to the other.

History of Syphilis.—Of 1100 male cases of tabes among the better classes Erb found that 89·45 per cent. had been infected with definite syphilis, and he wrote that in his opinion general paralysis had the same relationship to syphilis (*Les Affections Parasyphilitiques*). It is difficult to get so high a percentage of syphilitic infection in general paralysis, as, owing to mental enfeeblement and loss of memory, the history supplied by the patient is more often imperfect. The length of time that elapses from the date of the infection, the mildness of the symptoms and the absence of tertiary complications which usually obtain in general paralysis, contribute also to obliterate the facts of infection from the memory. Fournier, nevertheless, gives a list of 20 authorities who have obtained a definite account of previous syphilis in from 66 to 92·8 per cent. of their cases. Such statistics vary, for those supplied by private

patients of the rich classes give higher results than those of the poor, who are less observant; and men give higher results than women, as infection in the latter is often not noticeable.

Taking the average of the higher statistics as being nearer the truth, for in them a fuller history has probably been obtained, in about 80 per cent. of those suffering from general paralysis proof of syphilitic infection exists. Failure to obtain evidence in the remaining 20 per cent. is not remarkable under the circumstances already mentioned, and when we recall the fact that in the tertiary lesions of undoubted syphilis there is failure to obtain a history of syphilitic infection in a percentage as high. Lang of Vienna failed to get a history of infection in 36 per cent. of late forms of syphilis (Krafft-Ebing), Pernet failed in 20 per cent. of obvious syphilitic skin disease (Mott), and Fournier failed in 15 per cent. of cases of gumma of the palate (Ballet).

Syphilis without Manifestations.—The Wassermann reaction has thrown a new light on cases of unsuspected, undiagnosed, and unrecovered syphilis which helps us to understand why many cases of general paralysis do not give a history of syphilis. It has taught us that a person may acquire syphilis without showing any symptoms. Colles' law affirms that the mother of a syphilitic child is immune to infection, and the explanation of this fact is simply this—that she has already acquired syphilis. It is found that her blood gives a positive reaction in 3 cases out of 4, although in two-thirds of the cases the woman is unconscious of having been infected (Mackintosh and Fildes). It has also taught us that syphilis may persist for many years in the form of latent syphilis without any symptom. The vast majority of the cases of general paralysis suffer in this way, and in them no history can be obtained of any active syphilitic signs or manifestations. The Wassermann reaction has also been of use in clearing up difficulties due to the presence of congenital syphilis without any stigmata or symptoms of syphilis, or even malnutrition or defective development, which we now know is possible. These cases may ultimately suffer from adult general paralysis, and if congenital syphilis be unsuspected and acquired syphilis can be excluded, they present great etiological difficulties. Percy Smith has described such cases in adult women in whom syphilitic parentage was ultimately traced. An instructive account of two virgin sisters, the victims of congenital syphilis, who died of general paralysis at the ages of 42 and 43, is given by Christian Muller. In these women the stigmata of congenital syphilis were fortunately present and the existence of the disease

was recognised, but had they been absent these two cases might very easily have served as conclusive examples of general paralysis without syphilitic infection.

Varying Incidence of General Paralysis.—What is quite as impressive as the high percentages of syphilitic infection is the faithful way the incidence of general paralysis varies in localities, professions, sexes, and ages in accordance with the estimated variations in the amount of syphilis. It is more prevalent in urban than in rural asylums, and it reaches its maximum in large seaport towns like Leith and its minimum in districts like the Highlands of Scotland. It is 18½ times more frequent in the Royal Edinburgh than in the Inverness District Asylum among a similar class of patients. Soldiers and sailors are more frequently attacked than the clergy, and men with means leading a fast life in town than wealthy members of the Society of Friends. It accounts for a half to three-quarters of the insanity occurring among German officers. Men are attacked on an average about four times oftener than women; but in the richer classes the proportion may be 10 or even 20 to 1, while in the poor it may be less than 3 to 1, these figures, according to Blaschko, representing the proportion of syphilis in the two sexes (Mott). An exception to the general rule occurs in juvenile and adolescent general paralysis, where the two sexes are attacked in equal numbers, because the incidence of congenital syphilis is naturally equal in the two sexes at birth. It usually develops after an incubation period of 8 to 12 years, and it is rare before 30 or after 55, but is common between the ages of 40 and 45. Contrary to what holds good in men it is commoner in married women than in single, and among single women of the richer classes the disease is practically unknown, although it exists among prostitutes above 30 years of age. Conjugal general paralysis develops almost always in the wife after the husband (Moenkemöller), and if the reverse order occur it will probably be found that the wife had acquired syphilis before marriage and then infected her husband. The relative frequency with which conjugal general paralysis occurs, namely, 2·5 per cent. of the married couples affected (Mott), does not give any support to the hypothesis that there is a special or neurotoxic type of syphilis or spirochæte.

Countries and Races.—General paralysis, it is thought, is not so prevalent in primitive societies in the tropics where syphilis exists as in more highly civilised countries, and this may be due to the simpler and less strenuous life led in the former, or it may be due

to early marriage, different social customs, or to living mainly in rural communities. This opinion regarding its prevalence, on the other hand, may be based on erroneous or imperfect observation. The Japanese, for example, were formerly believed to be singularly free from general paralysis but not from syphilis, yet 15·8 per cent. were admitted to the Tokyo Asylum during the quinquennium from 1887 to 1901 (Peterson). The same opinions were expressed of the Abyssinians, and von Halban states that tabes is now more common in their country than in Vienna (Mott). The native Egyptians likewise were believed by Peterson in 1892 to have much syphilis but little or no general paralysis, but Dr. Warnock records in his annual report that 8 per cent. of the male admissions to the Cairo Asylum in 1909 were cases of general paralysis, the majority being Egyptians. According to Hutton, the disease has not yet appeared among the Eskimos of Labrador in spite of their terrible sexual excesses, but syphilis was introduced among them for the first time only in 1902. General paralysis is rare among Icelanders, and so is syphilis; and the same facts are true of the West Indian negroes, I am informed on good authority.

Percentage of Syphilitics Attacked.—General paralysis and tabes only develop in 3 to 5 per cent. of those infected with syphilis, and many have thought that this small percentage rate was a fact telling against the syphilitic hypothesis, indicating possibly that syphilis alone could not cause the disease and that another cause was probably associated with it. The tertiary lesions of syphilis affecting all the systems and not the nervous alone, according to Sir Douglas Powell, only occur in about 12 per cent. of all the cases originally infected with syphilis, and such lesions usually occur early, 40 per cent. of the lesions of the nervous system arising before the end of the third year (Byrom Bramwell). The soil for their development is nearly coextensive with the number infected. On the other hand, only 4 per cent. of the cases of general paralysis occur before the sixth year, during which interval, judging by the results of the Wassermann reaction in 1490 cases, 63 per cent. of those originally infected have recovered (Mackintosh and Fildes), and a few may have died. General paralysis, being a late manifestation, therefore occurs in 9 to 15 per cent. of the remaining third, who have not recovered from the attack of syphilis at the end of 5 years. This must be considered a fair proportion in comparison with similar conditions, as post-diphtheritic paralysis only occurs in 15 per cent. of those affected,

and it tells against the theory of a special type of syphilis in general paralysis.

Accessory Factors.—Among the causes believed to assist syphilis in the development of general paralysis, the principal are alcohol, sexual excess, overwork, worry, trauma, infections, intoxication, and heredity. No doubt the combined action of two injurious agents like syphilis and alcohol will be much greater that the action of each singly, and the strictly specific action of each will be intensified owing to a diminished general resistance. Moreover, it is possible that neurotoxic infections may by their action determine the onset of general paralysis just as a trauma may start a gumma. The occurrence of juvenile and adolescent general paralysis does not, however, lend support to the view that these accessory factors play an important, far less an essential, part. In these early cases all the additional factors can usually be excluded with the exception of heredity, yet the disease develops after the same incubation period as adult general paralysis and the symptoms present the same features, usually those of the feminine type.

Special reference may be made here to Dr. Ford Robertson's hypothesis that a diptheroid bacillus, to which he gave for convenience the name of bacillus paralyticans, was the chief cause of general paralysis. I am in a position to affirm from numerous observations, mostly negative, conducted with great skill and care at my instigation in the laboratory of the Stirling District Asylum by Dr. Muirhead, that diphtheroid bacilli are to be found in the blood or cerebro-spinal fluid in about 33 per cent. of the cases of general paralysis. These observations are confirmed by very few workers, and almost all of those who have carried out such investigations assert that they have found the blood and spinal fluid sterile. This was also Dr. Muirhead's experience with the vast majority of her cultures, but by repeating the experiments again and again, especially in relation to cerebral seizures, she was successful once or oftener in 33 per cent. of the cases. Not only have many pure cultures been thus made, but in a few cases the bacilli have been seen in blood smears, and on one slide in particular they are to be found in 13 different places and in two groups of 4 and 5. The significance of their presence is a subject on which, however, with all deference, I do not agree with Dr. Ford Robertson, among other reasons, owing to the fact that they are also to be found in the blood in a similar proportion of cases of delirious insanity or acute hallucinatory confusion. These diphtheroid bacilli may possess a neurotoxic

action and may produce nervous and mental phenomena, but they can hardly be the essential cause of general paralysis under such circumstances. They have been found, for example, in the blood of a girl suffering from post-rheumatic or choreic insanity associated with a streptococcus, who in a short time made a perfect recovery.

In the year 1897 Krafft-Ebing created a sensation by announcing that a friend of his had inoculated with active virus nine of his advanced general paralytic patients from whom no history of syphilitic infection could be obtained, and found that they were all immune. From this result he concluded that they had all previously been infected with syphilis, as well as the others in whom a definite history of infection had been obtained. This drastic experiment was, however, not scientifically conclusive, for there were no control cases inoculated with the same material, and no one knows if some of the healthy may not be immune to syphilitic inoculation. Had a reaction occurred, this would not necessarily have disproved syphilitic infection, for it is believed that a virulent and extensive reinoculation may produce local symptoms or superinfection in unrecovered syphilis. Unless, however, we assume that all patients suffering from general paralysis have been previously infected with syphilis it is remarkable that none are seen suffering from either the primary or the secondary symptoms of syphilis, considering the frequency with which they expose themselves to infection in the early stage. A few instances of recent syphilis have been recorded, but the significance of these exceptional observations remains in doubt (Tanzi. Ballet).

Positive Wassermann Reaction.—The finding of a positive Wassermann reaction in the blood and cerebro-spinal fluid of persons suffering from general paralysis in 1906, like Krafft-Ebing's experiments, was believed at first to have conclusively demonstrated its syphilitic nature. Though the reaction is a very reliable clinical test of syphilitic activity, it is an empirical reaction and is not strictly specific, for it can be obtained by other means than by the union of syphilitic antigen with antibody. In spite of this objection the undeniable presence of the reaction in over 99 per cent. of the cases of general paralysis has added enormously to the strength of the syphilitic hypothesis, if it cannot be held to have proved it conclusively.

It enables us also to differentiate general paralysis and tabes from every other condition that stimulates it excepting cerebro-

spinal syphilis, which is in itself a strong proof of a very close relationship between these diseases and syphilis. In some cases an active tertiary syphilitic process of the nervous system has co-existed with general paralysis and the combined lesions have been found after death. Links such as these between general paralysis and active syphilis are very interesting, for it is believed by Plaut that the nervous system is always prepared for the development of general paralysis by syphilitic changes. It· is possible, too, that some of the so-called premonitory symptoms of general paralysis, isolated phenomena such as temporary confusion, paralysis, or convulsion, which occur years before the development of the disease, are due to cerebral syphilis and are not early symptoms of general paralysis. For example, one of my patients acquired syphilis in 1883. Fourteen years later, during his honeymoon, he had a transient attack of aphasia ; 21 years later he had a similar attack after an exhausting bicycle run, and 29 years later had a third seizure which ushered in a typical general paralytic delirium ; and he has had several since. Were these first two seizures early symptoms of general paralysis, or were they a syphilitic complication ? According to Magnan most probably the latter, but it is possible they were isolated symptoms with prolonged remissions, a species of *forme fruste* or an intermediate benign condition.

The Parasyphilitic Hypothesis.—These observations, and the belief that the Wassermann reaction is a sign of active syphilis, have greatly weakened Fournier's hypothesis of parasyphilis, which is that general paralysis, tabes, and other diseases, while of syphilitic origin, were not of a syphilitic nature. This view was founded on the two observations that these diseases were not amenable to anti-syphilitic remedies, and the lesions found in them were diffuse and did not possess the characters of syphilitic lesions. The lapse of time between infection and the onset of the symptoms is no doubt also a factor to be reckoned with. There was much that was fascinating in this ingenious hypothesis, but it was never anything more than speculation. Our conception of the curability of syphilis has entirely changed since the Wassermann reaction has been employed to control its treatment. In the past many were unfortunately content to remove merely the external manifestations and call this a cure, although others wisely insisted on a prolonged course of treatment. We know now that while the manifestations of tertiary syphilis respond wonderfully to salvarsan and mercury, it is not possible in some cases to remove the positive

reaction from the blood. Not only do such cases form a link in this respect with so-called parasyphilis, but there are occasionally cases of true syphilitic manifestations which are quite intractable. As a general rule, the later the lesion the less amenable is it to treatment, and general paralysis of course occurs very late. On the other hand, to affirm that a lesion in spite of strong evidence is not syphilitic because it is unlike any other known lesion, is an unscientific assumption, especially as our knowledge of late syphilitic phenomena, thanks to the Wassermann reaction, is only in its infancy as yet. The parasyphilitic hypothesis is an offence against the *lex parsimoniæ*, which affirms that the simple explanation should be preferred to the more complex, and according to this, general paralysis and tabes should be considered signs of active syphilis and not of parasyphilis.

The Discovery of Spirochetes in the Brain.—The problem of the etiology of general paralysis appears to have been finally and conclusively settled by the finding at the end of the year 1912 by Noguchi of the *spirochæta pallida* in the brains of 14 cases of general paralysis (*Journ. of Experimental Medicine*, February 1913). He employed a modification of the Levaditi method of staining, and he hopes by improving the technique to find it in a larger proportion of cases than 1 in 5. This is a most important and epoch-making discovery, for it not only decides for all practical purposes many theoretical questions but it also points with confidence to one way and one alone of prophylaxis and treatment. The spirochaetes are found in large numbers, as many as a dozen being sometimes seen in the field, in the grey matter of the convolutions. None are seen within the peripheral or neuroglia layer of the cortex or in the pia arachnoid, and few are found either in the white matter or round the vessels. In almost all instances the spirochaetes seem to be burrowing among the nerve cells. All these cases were of undoubted general paralysis, for the possibility of tertiary syphilis was carefully excluded by microscopical examination. A very interesting and important point is the localisation of the spirochaetes among those cells, whose functional disturbance and degeneration is the probable explanation of the symptoms of the disease, and their proximity to the cells points to them as the immediate cause of their disordered function and degeneration. The theories of a parasyphilitic toxin, of secondary infections or of other accessory factors, sink into insignificance beside this convincing fact, and no other conclusion can be drawn from it than this, that general

paralysis is one of the manifestations of active syphilis—a late manifestation, it is true, for which no doubt explanations will be forthcoming, but nevertheless one of genuine or true syphilis.

In conclusion, it cannot be alleged that this great discovery by Noguchi is either unexpected or overturns our conceptions of general paralysis. The previous evidence, on the contrary, is in complete harmony with it: frequent references to the possibility of this discovery are to be found in recent literature; and many a futile search has been made for the spirochæte before the skill and perseverance of Noguchi were rewarded. Rather can it be said that it was owing to our failure to demonstrate the organism that the theories of parasyphilitic and other toxins continued to exist. The keystone has now been found and fitted to the arch, completing a solid structure on which we can safely base our theories of prophylaxis and treatment.

A CASE OF RUPTURED VERY EARLY PRIMARY OVARIAN PREGNANCY.*

By GEORGE CHIENE, M.B., F.R.C.S., Assistant Surgeon, Edinburgh Royal Infirmary.

NOT very long ago the possibility of primary ovarian pregnancy was denied by some of the greatest gynecological authorities, and doubt has been cast on many cases published as such, owing to insufficient details having been given by the author.

Primary ovarian pregnancy is now a recognised entity; not only so, but cases of primary abdominal peritoneal pregnancy have been recorded.[1]

Bland Sutton was only convinced that primary ovarian pregnancy existed after investigation of Van Tussenbroek's case. Lawson Tait denied the possibility of ovarian pregnancy, and was also one of those who taught that serious pelvic hæmatoceles were always due to tubal abortion or a ruptured tubal gestation. Hæmorrhage giving rise to serious symptoms can, however, result not only from a primary ovarian pregnancy, but from ovarian hæmorrhagic cysts, and normal Graafian follicles which have ruptured.[2]

That the latter can give rise to such symptoms should be remembered; they are not only of interest, but may be of importance from a medico-legal point of view.

Norris and Mitchell,[3] reporting a case of primary ovarian

* Read before the Edinburgh Obstetrical Society, 8th January 1913.

pregnancy in May 1908, mention 40 recorded cases, 16 of which they describe as positive, 15 probable, and 9 fairly probable.

In August 1910 Norris[4] gives a résumé of 19 positive cases, including Munro Kerr's case, which is fully described and illustrated in *Contributions to the Study of the Early Development and Imbedding of the Human Ovum* (Bryce, Teacher, and Munro Kerr, 1908). Many other probable cases were, however, excluded. In the same year Warbanoff[5] collected 33 well-established cases, and adds another.

Others have been published more or less fully since then, references to some of which are given.

Of the more recent cases, that reported by Graham[6] is the best as regards the histology of the condition. Eardley Holland's[7] is unique in that there is a possibility of the case being one of bilateral ovarian pregnancy. Menge's[8] case is of interest, owing to the fact that a normal and ovarian pregnancy were both present; not only so, but the pregnancies went on to full term, and both children lived.

My case complies with the conditions laid down by Spiegelberg,[9] also that of Williams,[10] but only partially conforms to the additional requirements demanded by Norris,[4] namely, that "the tube on the affected side should not only be intact, but should be microscopically free from any evidence of gestation." That a microscopical examination of the tube is of scientific interest no one will deny, but that it is clinically essential, or even advisable in all cases, is another question.

That it may be of importance to preserve the tube is well illustrated in a case described by Fransden,[11] in which the ovum escaped from the ovary on one side and passed through the Fallopian tube on the opposite side, with normal uterine pregnancy as a sequel. His patient had the left Fallopian tube removed for an ectopic gestation, the stump being covered with peritoneum; the corresponding ovary was not interfered with. The right ovary was removed, as it was composed of a thin-walled unilocular cyst and its pedicle covered by peritoneum. Accessory ovaries were looked for, but none were found. Seventeen months later the patient had a normal confinement. Banks[12] purposely left the tube and a small portion of the ovary in the case he records.

In the case about to be described the tube was not removed, as, owing to the serious condition of the patient at the time of the operation, it was thought advisable to do only what was absolutely necessary; and further, the relationship of the parts, demonstrated to those present at the operation, showed the tube

and affected part of the ovary to be in no way connected. Fig. 1, taken from a sketch made at the termination of the operation, shows the relationship of the parts. The condition found at operation was similar to that described and illustrated by Barrows.[13]

In practically all recorded cases of extra-uterine gestation there is either a missed period, or a history of abnormality in the duration or regularity of the periods. In my case the menstrual history was absolutely normal, and is almost similar to that described by Arnold Lea,[14] both in regard to this point and in the fact that there was no evidence of the expulsion of decidual membrane; in both apparently normal menstruation returned at the expected time.

The after-history corresponds to that of a case mentioned by Williams,[15] in that the patient soon afterwards became pregnant, and in due course gave birth to a healthy child.

CLINICAL HISTORY.

The clinical history is as follows:—Mrs. J. L., aged 34, was admitted to the Edinburgh Royal Infirmary on the evening of Thursday, 22nd September 1910.

On the previous Monday (three days before admission), she awoke during the night suffering from abdominal pain, chiefly on the right side; this pain passed through to the rectum and gave rise to a bearing-down sensation. On Tuesday morning she took castor oil, and feeling better after it had acted, she went about the house all that day and until 1 P.M. on Thursday, when the pain returned with great severity, making her cry out and roll on the floor. The pain again passed "down behind." There was no vomiting. Her doctor was sent for, who ordered an enema, with good results, but as the pain continued he sent her to the Royal Infirmary. I was telephoned for, being told that a case of acute appendicitis had been admitted requiring operation. On hearing the history I suspected a ruptured ectopic gestation, and asked about the gynecological history; this had not been inquired into, but was taken while I was on my way to hospital. On arrival I found that it was negative. She had six children, the youngest of which was $2\frac{1}{2}$ years of age; there had been no miscarriages; she was perfectly regular, and expected the next period three days later. Her previous health had been good. The temperature was 99·4; pulse 120, small and feeble; respirations 24 per minute. The patient was pale, looked ill, and had a drawn and anxious expression. She stated that she felt very ill.
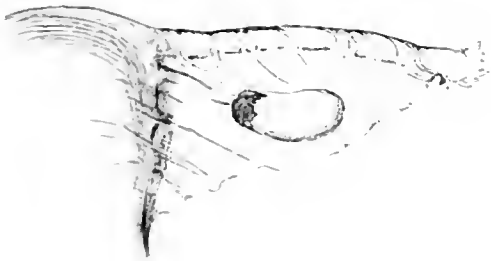
FIG. 1. Diagrammatic representation of the relationship of the blood-clot, protruding from the inner end of the ovary, to the fallopian tube.

FIG. 3. Drawing from microscopical section (5 diam.), showing normal ovarian tissue in the lower half, with large blood-clot protruding from upper extremity, the greater portion of which is surrounded by ovarian stroma. Chorionic villi throughout the blood-clot are represented by darker shading.
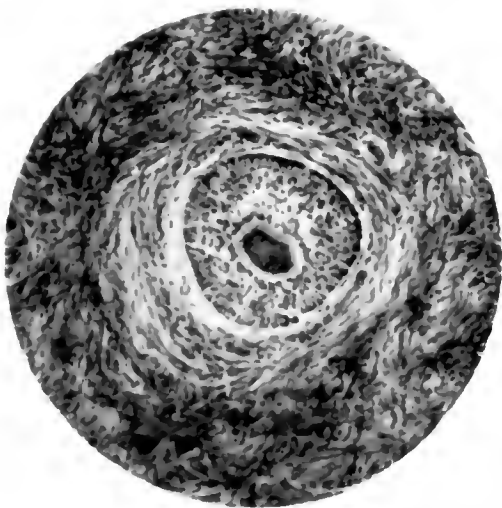
FIG. Micro-photograph (50 diam.) of ovum with its ovarian stroma, in the vicinity of the blood-clot.
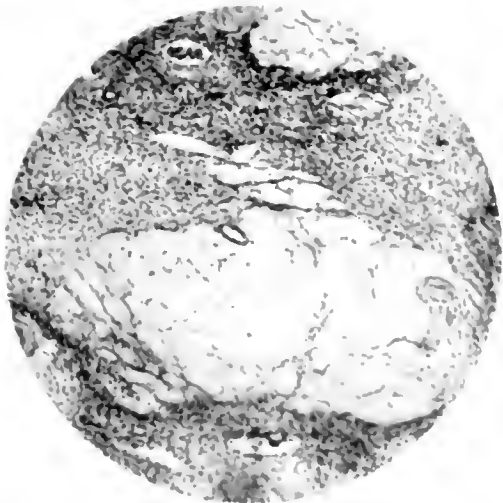
FIG. Micro-photograph of section of ovary in the vicinity of the blood-clot showing corpus albicans.
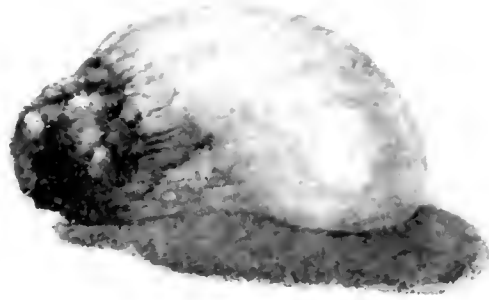
Fig. 2.—Watercolour drawing, natural size, of the right ovary, after removal, showing protrusion of blood clot.
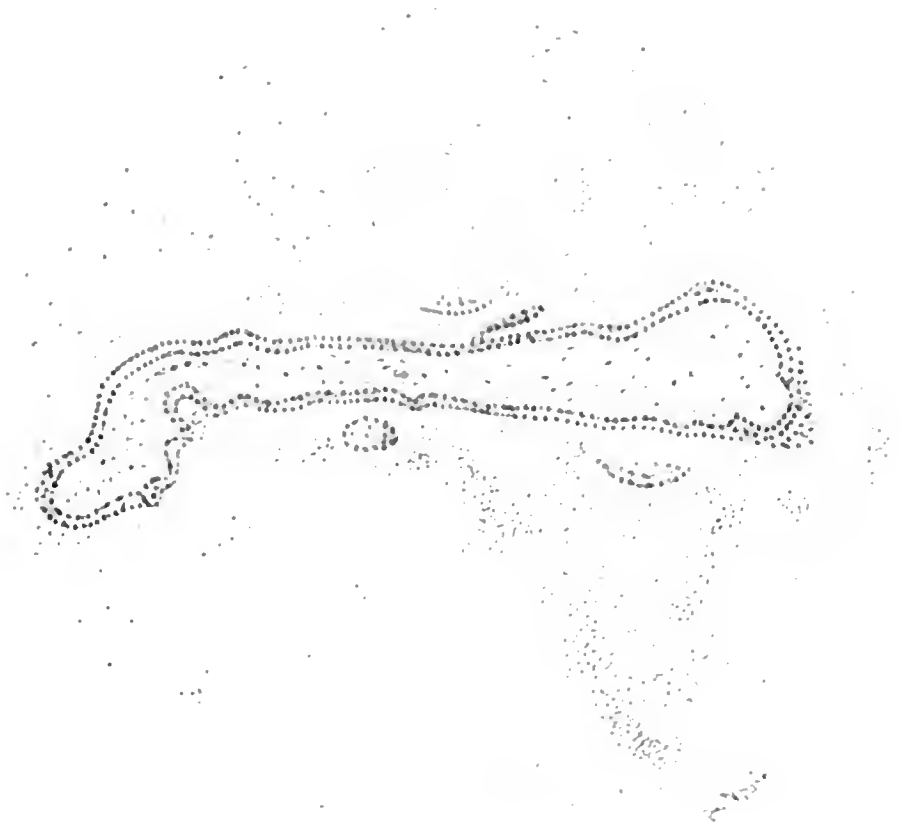
Fig. 3.—Watercolour drawing from microscopical section, showing chorionic villi lying in blood clot. The two layers of epithelial cells (cellular layer or Langhan's layer, and the layer of Syncytium) are well shown.

Subjective Examination.—The patient complained of great pain all over the abdomen, but especially in the right iliac fossa; the pain passed through to the back, "down behind." She felt sick and faint, but did not vomit. There was no trouble with micturition.

Objective Examination.—The abdomen was slightly distended, but moved fairly well on respiration. On palpation there was tenderness over the whole abdomen, most marked in the right iliac fossa; there was, however, no rigidity of the abdominal wall such as one associates with inflammatory lesions or peritonitis, but a distinct doughy feeling was present.

On vaginal examination great tenderness was elicited, so great as to make it impossible to gain information of any value.

On rectal examination great tenderness was again complained of, but a distinct fulness could be felt in the pouch of Douglas.

On further questioning, the patient admitted having had three or four fainting turns during the afternoon, the first occurring at 1 P.M. with the onset of the acute pain.

The symptoms were suggestive of internal haemorrhage, but the fact that the patient's menstrual history was perfectly regular tended to negative, although not absolutely debar, the previously suggested diagnosis of ruptured ectopic gestation.

Owing to the patient's critical condition it was thought advisable to perform a laparotomy at once, and to leave the diagnosis an open question.

On opening the abdomen the peritoneal cavity was found to be full of blood, partly clotted, partly fluid. Some of the blood-clot having been removed, the right tube was examined and found perfectly normal. A bulging mass, about the size of a cherry, was observed to be protruding from the uterine end of the right ovary, about two and a half inches away from the fimbriated end of the tube. This is beautifully illustrated in the water-colour drawing (Fig. 2).

The ovary was rapidly removed. The left tube and ovary were examined and found normal, also the appendix. The uterus was of normal size. More blood was swabbed out, the abdomen flushed with normal saline, and the wound closed. The operation lasted half an hour.*

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* I took the ovary away with me, and the same night submitted it to my friend Dr. Wm. Fordyce, who admitted that my supposition was probably correct, namely, that this was a case of true ovarian pregnancy.

Orders were given that the blood-clot removed was to be carefully preserved, but owing to an unfortunate misunderstanding between the resident surgeon and the nurse this was not done.

The after-treatment consisted in salines per rectum every four hours. The patient was very collapsed for two days, but after that the convalescence was uneventful. She was up on the twelfth day, and left hospital two days later. The patient was shown at a meeting of the Medico-Chirurgical Society on the 14th of December 1910. Her further history has already been referred to.

HISTOLOGICAL DATA.

The ovary, after removal, was at once placed in Jores' solution, and after the colour had been brought back, water-colour drawings were made of it from four points of view, one of which is illustrated (Fig. 2). It was then put through various alcoholic solutions and was embedded in paraffin without being interfered with in any way. Serial sections of ·01 mm. were then cut in the long axis of the ovary, the half of which were stained and all carefully examined. After this, sections of the other half were taken at intervals, stained and examined, it being thought unnecessary, from the examination of the first half, to examine the whole of the second series. As is always the case, the blood-clot interfered with the cutting of the sections.

Fig. 3 is a typical example of what was found in practically every section. No fœtus was discovered, but chorionic villi were present in the blood-clot (see Fig. 4) of a great number of the sections. In no case did they encroach on the ovarian stroma. No corpus luteum or lutein cells were seen, nor was any decidual tissue discovered.

Presuming that impregnation had not taken place prior to the last menstrual period, which was normal, the possibility of conception had occurred on two occasions: the first, two or three days after the last period, and the second, ten days later. In all probability, therefore, the pregnancy was either one of ten or twenty-two days' duration.

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MULTIPLE MYELOMA, AND ITS ASSOCIATION WITH BENCE-JONES' ALBUMOSE IN THE URINE.

By THEODORE SHENNAN, M.D., F.R.C.S.,
Pathologist, Edinburgh Royal Infirmary.

PART I.

MULTIPLE MYELOMA may be defined provisionally as a primary new formation developing simultaneously in many of the cancellous bones, especially in those of the trunk and skull, less frequently affecting the long bones; chiefly attacking males above the age of forty years; in many cases forming masses which may be visible and palpable during life; composed of more or less rounded, nucleated cells which correspond to one type or other of the marrow cells, or their precursors; resulting locally in extensive absorption of bone; forming no true metastases; associated with severe neuralgic pains, intermittent high temperature, and the presence of Bence-Jones' albumose in the urine.

My attention was recently directed by Mr. Cathcart to a case of this disease coming under the Workmen's Compensation Act. This case presented considerable difficulties, and as I have had the opportunity of examining the tissues from at least two other apparently similar cases during the last 18 months, it seemed to me profitable to peruse the literature of the subject, so as to try to come to rational conclusions as to the nature of the process and its proper place in the classification of disease.

Only a small proportion of cases have been correctly diagnosed during life. This is not astonishing, seeing that the physical signs of myeloma resemble those of a considerable number of other

diseases. For example, cases have been diagnosed as sciatica, chronic rheumatism, osteomalacia or mollities ossium, miliary tuberculosis, pulsating osteo-sarcoma, nephritis, progressive anæmia, pseudo-leukæmia, chronic relapsing fever, transverse myelitis, multiple myelogenous sarcoma, etc. On the other hand, a correct diagnosis of multiple myeloma was made during life in the cases of Ellinger (1898), Bozzolo (1898), Buchstab and Schaposch-nikow (1899), Wright (1900), Bradshaw (1898 to 1902), Hamburger —two cases—(1901), Donetti (1901), Kalischer (1901), Conti (1902), Parkes Weber (1903), Vignard and Gallavardin (1903). The proportion of diagnosed cases has risen during the last ten years, great reliance being placed on the presence of albumose in the urine.

The literature of the subject practically begins with Henry Bence-Jones' communication, "Some Account of a New Animal Substance occurring in the Urine of a Patient labouring under Mollities ossium." This paper deals almost wholly with the chemistry of the protein. The minute anatomy of the case was described by John Dalrymple. These papers are abstracted in the *Edin. Med. Journ.* for 1850 (vol. lxxiv. No. 185, p. 357).

The case was that of a male, æt. 47, who had been infirm for thirteen months, dating the onset of his illness from a severe strain experienced in vaulting from an underground cavern. His attend-ant, Dr. W. Macintyre, first noticed, on 30th October 1845, the peculiar reaction in his urine, which is now known as Bence-Jones' albumose reaction. Specimens of the urine were sent next day to Bence-Jones for investigation, and his description of the characters of the urine is very similar to that which obtains at the present day :—"The urine gave no precipitate with an excess of nitric acid, unless left to stand, or unless heated and left to cool, when it became solid. This solid was re-dissolved on the application of heat, and again formed on cooling. Hydrochloric acid gave the same solid precipitate, soluble by heat. Strong acetic acid gave only a slight precipitate, re-dissolved by heat." *Occasionally the reaction was absent.* The specific gravity of the urine varied from 1034·2 to 1043·2, and the total solids from 37·93 to 126·3 per 1000. The average amount of the protein was 66·97 parts per 1000. At the post-mortem examination—two months later—"the bony structure of the ribs was easily divided by the knife, and the bodies of the vertebræ were capable of being cut into slices." The case was regarded as one of "mollities ossium, not general, but partial, the softening not having extended to the

cylindrical bones. A substance, hitherto unknown, with much phosphate of lime, was carried out of the same (*i.e.*, the bones) through the urine." Bence-Jones clearly distinguished the substance from albumen, stating that it gave reactions similar to those of the "so-called hydrated protoxide of protein," and named it "hydrated deutoxide of albumen." Dalrymple noted that the cortical layer of the bones, though very thin, was still hard, but did not realise the importance of this character as distinguishing the disease from osteomalacia or mollities ossium. Microscopically, the disease was characterised by the appearance of great numbers of round and oval nucleated cells—1½ to 2 times the size of red-blood corpuscles—which had increased at the expense of the fat cells and spongy bone. These cells contained very fine granules He also refers to an earlier case reported by Solly (*Medico-Chirurg. Trans.*, Lond., vol. xxvii. p. 453), in which the marrow apparently presented somewhat similar characters, but on reference to this paper I find that Solly's second case was one which corresponds more to a case of general osteomalacia, though presenting some features like those of a multiple myeloma.

A second authentic case was described by Hermann Weber in 1867. A good illustration accompanies the paper.

It was not till 1873, however, that the disease was distinguished clearly from other diseases of bone, by J. v. Rustizky, who realised that the new formation consisted of cells analogous to those of active bone marrow, and gave it the name "multiple myeloma." He regarded it as a local hyperplasia of the marrow, of benign nature, distinguishing it from Virchow's myelogenous sarcoma. The next case was described by Rüneberg in 1883 under the name myelogenous pseudo-leukaemia, and then in 1885 Zahn, though using Rustizky's term myeloma, decided that his case was also one of myelogenous pseudo-leukaemia, though inclining to the belief that the growth was sarcomatous.

W. Kühne in 1883, on chemical examination of a urine containing Bence-Jones' protein sent to him in 1869 by Stokvis, a Dutch physician,* was the first to determine that the protein substance was of the nature of albumose, though differing in some respects from digestive albumose, while Kahler in 1889 was the first to state the constant relationship of the albumosuria to multiple myeloma, and in consequence the disease is often termed "Kahler's disease."

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* The patient was a man who died after nine months' illness from a disease diagnosed as osteomalacia.

Ten years more elapsed before other cases were reported, but since then numerous cases, not all, it is true, completely authenticated, have been published. Some of the papers are somewhat involved, the nomenclature is as multiple as the disease, and the conclusions as to the precise classification are as varied as the nomenclature.

Clinical Characters.—About 75 per cent. of the reported cases have occurred in males in the fifth and sixth decades of life. The ages of the patients vary from 36 years (Senator) to 70 years (Bradshaw and Warrington, 1899). The duration of the disease varies from 4 months (Winkler) to 8 years (Kahler). The average duration is usually stated to be about 2 years. Most of the patients have belonged to the poorer labouring class, but several have been in comfortable circumstances—*e.g.*, Kahler's patient, a physician, and Macintyre's patient, a grocer. There is frequently a history of the disease being first noticed after a severe mechanical injury or muscular strain. The first symptoms noted are usually severe or even agonising pains, frequently of a stabbing character, referred to some part of the thoracic wall, vertebræ, pelvis, or to the extremities or head. These pains are increased on pressure or on muscular exertion. They may after a time disappear, only to return later, the intervals of relief becoming shorter and shorter as the disease progresses. Stiffness of the joints of the hands has been noted (Weber), and atrophy of the small muscles of the hand (Williams and Evans). In many cases, soft prominences, occasionally pulsating, appear on ribs, sternum, clavicles, or cranial bones. These may be of large extent, but do not, as a rule, project far above the surface. Fractures are not uncommon. Kyphosis is a common feature in well-marked cases, and the dorsal spinous processes may disappear, being replaced by soft tissue. In some cases a sharply angular curvature of the spine has developed rapidly and, in consequence of these changes, the patient becomes unable to maintain the erect posture. Distortion of the thorax may be extreme. Paralyses develop as the result of pressure upon nerves and upon the spinal cord, with loss of control of the sphincters. Senator discusses this feature at length. Paralysis developing in absence of marked alterations in the vertebral column is explained as depending on the severe toxæmia, which also in the later stages produces a severe cachexial condition and anæmia of the type of grave secondary anæmia or pernicious anæmia. Some authors suggest that the paralysis may be due to the action upon the ganglionic

cells of the albumose which is circulating in the blood-stream. The temperature may be high with intermissions, giving the impression that the patient is suffering from a disease of infective-inflammatory nature. Emaciation may be extreme, and the patient may suffer from diarrhœa, and from incessant coughing with abundant expectoration. The fatal issue is due to exhaustion, often accelerated by septic bronchopneumonia.

Nothing is known of the etiology of the disease. Many of the patients have admitted a history of previous syphilis, and in perhaps most of the cases there has been co-existent chronic nephritis, either parenchymatous or interstitial.

Albumosuria.—The almost constant presence in these cases of albumosuria has already been referred to. Bradshaw, who was the first in this country, and probably the first of all observers, to diagnose a case during life, gave the name "myelopathic albumosuria" to the disease. The protein has been demonstrated at periods varying from 11 weeks to 5 years from the commencement of the disease. Its quantity varies from 0·025-0·05 per cent (Ellinger) to 6·7 per cent. (Macintyre and Bence-Jones). These figures are usually incorrectly quoted. Its occurrence may be intermittent, as was first noticed by Bence-Jones. Its presence is always of fatal import. It is present in the blood, in the fæces, and in the affected bones (Weber). Albuminuria may be present as well. The reactions for albumose are well known and need not be repeated here, particularly as they are given in full by Paget Moffat. One peculiar property may be noted. The opacity appears on heating to a temperature of 55° to 60° C.; it disappears at 80 to 85 C., to reappear on cooling. Hutchison, in Parkes Weber's case, concluded that the seat of its formation was the affected bone marrow, thus differing from Magnus-Levy (1889), who believed it to be a non-assimilated digestive proteid. Weber (1903) found that alteration of the diet had no effect on the amount excreted, and suggested that the cells of the new growth produce digestive enzymes, by the action of which, on the albuminous constituents of blood serum, the Bence-Jones' albumose is manufactured.

Williams and Evans (1910) believe that the protein is probably a derivative of the chrondro-mucin of bones and tendons.

This albumose has been reported as occurring in the urine in one or two cases of osteomalacia (*e.g.*, Raschke's), but there are grounds for doubting the correctness of the diagnosis. Fitz noticed it in a case of myxœdema, but as no post-mortem examination was

conducted, this case cannot be admitted as an exception. Askanazy (1902) demonstrated its presence in a case of lymphatic leukæmia of myelogenous origin. Here the changes in the marrow were very similar to those in myeloma, except for the predominance of lymphocytes, and, as Hamburger points out, this case must remain an exception to Kahler's conclusions, until the relationship of myeloma to leukæmia and to pseudo-leukæmia is determined. Permin (1903) also noticed its presence in multiple metastatic growths of ribs and sternum vertebrae, in which round, spindle-shaped, and giant cells were found microscopically.

On the other hand, its absence has been reported in several authentic cases of myeloma. One cannot yet absolutely deny the accuracy of such statements: but, in view of its occasional intermittence in other cases, it must be clearly shown in all cases that the urine has been examined frequently at intervals.

Examination of the Blood.—In the early stages of the disease, no important alterations can be detected. In late stages, changes such as occur in severe secondary or pernicious anæmias develop. As a general rule, however, marked blood changes tend rather to discredit a diagnosis of multiple myeloma. The fatty marrow of the long bones apparently shows small evidence of reaction.

Differential Diagnosis.—*Osteomalacia* commonly attacks preg-nant or puerperal females, *i.e.* at a period of life earlier than that at which myeloma usually occurs. Litzmann collected 131 cases of this disease, and of the number 120 were in females. In the non-puerperal variety, which begins in the bones of the thorax and extremities, the excruciating pains are not a prominent feature; fractures seldom occur: decalcification of the bones is more prominent than absorption, and the softening affects also the cortical layers, which, though thinned, remain hard in myeloma, in which the bones are friable rather than pliable as in osteo-malacia. The diagnostic importance of albumosuria has already been referred to.

Myeloid sarcoma seldom, if ever, attacks the ribs and vertebræ. It is usually located in the ends of the long bones. Micro-scopically, the cells vary in character, being more often spindle-shaped than rounded, and giant cells are ordinarily present, sometimes in great numbers. The bone is absorbed, but it is continually being re-formed under the periosteum, constituting a more or less complete enveloping shell over a tumour even of huge dimensions. Other *central sarcomata* and *periosteal sarcomata* are differentiated by the age at which they occur, the character

of the cells composing them, and by the occurrence of secondary metastases in the internal organs.

In cases of *leucocythæmia*, though the bone and marrow changes may display a considerable resemblance to those in myeloma, yet the blood picture is pathognomonic, and also the alterations present in the spleen, lymphatic glands, and other organs: while the proliferation in the marrow is not confined to one variety of cell, as in myeloma.

In the *pseudo-leukæmias* (*e.g.*, Hodgkin's disease), the marrow changes may approximate to those found in some cases of myeloma, but the spleen, lymphatic glands, and other organs show special alterations which are not present in myeloma.

Myeloma has to be distinguished also from spondylitis deformans, tuberculous caries of the vertebræ, muscular rheumatism, articular rheumatism and rheumatoid arthritis, sciatica, lumbago, chyluria, osteopsathyrosis (fragility of bones), and other conditions. The differential diagnosis is discussed at length especially by Parkes Weber (1903), Jellinek, Hoffmann, and Hamburger.

Many observers remark the usefulness of the Röntgen rays in diagnosis.

Morbid Anatomy and Histology.—There exists a fair degree of unanimity as to the general characters presented by multiple myeloma to the naked eye. The histological characters, on the contrary, not only vary considerably, but have occasioned great diversity of opinion as to the nature and origin of the cells composing these remarkable new formations.

Morbid Anatomy.—From the outer aspect the affected bones may show no visible pathological alteration, or they may present soft rounded projections or localised swellings: or they may be practically completely disorganised and replaced by soft, in some cases almost fluid, new tissue. Even when showing no visible alteration, it may be possible to cut them with the knife. They are usually less resistant to pressure than normal bones, and are more easily broken. On section the marrow and spongy bone are replaced by greyish-white, greyish-yellow, reddish-grey, dark red, or brown, sarcomatous-looking tissue; in some cases diffuse and imperfectly demarcated from the surrounding spongy bone and marrow; in other cases forming circumscribed masses of a colour different from that of the surrounding bone-marrow, numerous or solitary, larger or smaller, sometimes confluent and presenting a marbled aspect. In Saltykow's case the masses were red in the centre, with a narrow grey peripheral zone. They are commonly

homogeneous or gelatinous in appearance, and hæmorrhagic areas may be present. Central necrosis may occur.

The bony trabeculæ are completely absorbed within the masses, and where even a small focus of new growth presses against the cortical layer of bone, this becomes rapidly absorbed, so rapidly, indeed, that there is not time for a new subperiosteal layer of bone to be formed. A defect results, through which the growth invades the periosteum and may spread by direct continuity to the adjacent soft tissues. displacing these and forming rounded prominences which in rare instances may reach the size of a walnut or small apple (Rustizky). Even larger masses formed in MacCallum's case, in which the iliac bone was affected. These extensions seem rather to displace than to infiltrate the soft tissues. In no case have the prominences been covered with a thin egg-shell-like layer of bone. such as is constantly seen in myeloid sarcoma. The term "myelomatosis" has been applied to the diffuse new formations.

Individual bones may escape attack altogether.

The *cranial bones* may show numerous small nodules starting in the diploë, and these, on further development, cause defects in the inner and outer tables, with worm-eaten margins. Corresponding patches on the dura mater. or projections on the outer aspect of the skull. may develop. The *sternum* is very frequently affected ; it may show angular depressions or projections ; it becomes very fragile, so that it frequently breaks during removal. The *ribs* may all display prominences, or spindle-shaped swellings, or only one or two on either side may show these changes. The swellings may seem to invade the pleura, but this is only apparent, the pleura being elevated over the swellings. The ribs may be greatly distorted. In the case of the *vertebral column*, any part or the whole of the spongiosa of individual bones may be replaced. Masses may project on the surface, either anteriorly, laterally, or posteriorly, and when occurring in the last situation may compress the spinal cord. The *long bones*, in spite of statements to the contrary, are not often affected, but when attacked show the same general characters as have been described in the case of the spongy bones.

The disease is confined to the osseous system, and may affect the greater part of it. Cases of apparent metastasis, such as Hoffmann's (in liver), Lubarsch's (in mediastinum), Verebély's (in larynx), and Kahler's (in inguinal region and in infra-spinatus), have to be submitted to careful scrutiny, seeing that such " meta-

stases" are occasionally capable of another explanation than that they are true secondary colonies the formation of which characterises malignant tumour-growth. Verebély's case is of special interest. In it an apparent metastasis had taken place to the cricoid cartilage, but this and other laryngeal cartilages had undergone ossification, with development of marrow. As for the other cases, it must be remembered that islets of hæmatopoietic bone marrow have not infrequently been demonstrated in soft tissues and organs outside the bones, and if multiple myeloma be regarded as a disease especially attacking functionating "red" marrow, then in that disease all such marrow, whether within or outside the bones, must be liable to undergo the peculiar transformation described.

Still, even granting all this, we are not yet in a position either to affirm or deny that in rare cases myeloma may form true metastases in the soft tissues.

The spleen, liver, and lymph glands may become enlarged, congested, and beset with grey nodules and streaks, but these or similar changes occur in other diseases, and are not characteristic, and certainly not constantly remarked, in cases of multiple myeloma. As a matter of fact, when these organs show marked alterations in myeloma, an incorrect diagnosis may be suspected, or some intercurrent affection has obscured the issues. Nevertheless it must be recognised that competent observers have reported the presence in these organs of clusters of cells similar to those occurring in the local foci in the marrow.

Morbid Histology.— In all cases the new growth is composed of closely-set round cells, of uniform type in individual cases. These cells are very similar to the cells of small round-celled sarcoma, but differ from these in possessing a larger proportion of cytoplasm. The shape may be oval, or from mutual compression the cells assume a polygonal form. They lie in clusters and rows enclosed in a reticulum, the strands of which are usually very fine, at times hardly appreciable, but occasionally are denser and thicker. The vascularity of the new growth varies greatly, dominating the naked-eye appearance, so that, depending on the size and number of the blood-vessels, and the presence of red blood corpuscles, either scattered or collected in hæmorrhages, the colour may vary from a light grey to a dark reddish-brown. The walls of the vessels consist usually of a single layer of endothelium, supported by the cells of the new growth.

Considerable difference of opinion exists as to the precise nature of these cells, but for the present it will suffice to state

the facts which have been observed, leaving their discussion to a later part of my paper.

The cells have been relegated to the following groups :—

(*A*) True Myelocytes.—These are mononuclear cells, 12 to 18 microns in diameter, with relatively large, round or oval, central or excentric, faintly staining nucleus, with fine scattered chromatin, which in some cells may be clumped more or less towards the centre of the nucleus. Occasionally the chromatin is condensed (pyknotic), or the nucleus may be vesicular, the chromatin forming a layer against the nuclear membrane. With suitable staining the cytoplasm shows the presence of neutrophil granules.

(*B*) Pre-myelocytes or Myeloblasts.—These cells correspond closely in appearance to the myelocytes, but the cytoplasm is non-granular. The cells composing the new growths in the greater number of cases of multiple myeloma conform to this type.

(*C*) In other cases the cells correspond to the large lymphocyte, and the name "lymphocytoma" has been applied to this group of myelomata.

(*D*) Wright of Boston was the first to point out that some myelomata are composed of cells that correspond closely to Unna's plasma cell. Christian, Hoffmann, Weber and Ledingham, and others describe similar appearances, and the term "plasmacytoma" or "plasmoma" has been applied to this class. In these cells the chromatin of the nucleus is collected in coarse granules placed against the nuclear membrane so as to present a radiating appearance—the "wheel-nucleus." The cytoplasm is basophilic and the nucleus is surrounded by a clear zone, which separates it from the deeply-staining cytoplasm.

(*E*) Finally, Ribbert describes a case of myeloma in which the masses were composed of cells corresponding to megaloblasts, and named the new growth "erythroblastoma." So far, this observation is unique, and several authors suggest that the cells may have been myeloblasts showing atypical staining reactions.

The difficulties which have to be overcome before we can accept the lymphocytoma and the plasmacytoma as "homologous" new growths of bone-marrow will be discussed later.

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[*] I have not had access to the papers marked with an asterisk, but have indicated the authors who refer to them.

RHEUMATOID ARTHRITIS IN CHILDREN.*

By JAMES LINDSAY, M.D.(Edin.), M.R.C.P.(Lond.),

Hon. Physician, Royal Mineral Water Hospital, Bath.

ALTHOUGH mentioned as far back as 1864 by Cornil, it is only since 1897, when Still published his cases, that this condition has attracted the attention which it deserves. To a great extent the difficulty which has existed with regard to the study of this condition has arisen not so much from the infrequency with which it is met as from the variation in the terms which have been employed by various writers in describing it. Up to the present time we have been dependent on the mental concept of each individual observer with regard to descriptions of such cases, and thus it is that writers differentiate between rheumatoid arthritis, arthritis deformans, osteo-arthritis, and Still's disease, although, as the writer believes, all are describing one and the same condition. This uncertainty of nomenclature has given rise to so much confusion that it has even been asked in a standard work in medicine whether or no such a condition as rheumatoid arthritis occurs in children. There can, however, be no doubt but that cases of rheumatoid arthritis do occur in children which in their onset, course, symptoms, physical signs, and post-mortem changes are the exact counterpart of those occurring in adult life. There is indeed no variation in those cases of rheumatoid arthritis occurring in children from those which are met with in adults, excepting that as a rule the younger the patient the more rapid is the progress of the disease. We are coming more and more to consider rheumatoid arthritis as a term applied to a class of polyarticular arthritides which exhibit certain characteristics in their onset, course, clinical and pathological appearances, and which would appear to owe their origin in many cases to some infective or toxic agency.

Still originally stated that the condition which he described differed from rheumatoid arthritis in that the latter was characterised by osteophytic change, eburnation of bones, bony thickening, lipping, irregularity, and grating—a description typical of osteo-arthritis (hypertrophic arthritis), but directly contrary to

what occurs in true rheumatoid arthritis (atrophic arthritis), in which rarefaction is the outstanding feature.

The second point which he urged was that the condition he described could be differentiated from rheumatoid arthritis by the presence of glandular enlargement. That enlargement of the spleen and lymphatic glands does, however, occur in rheumatoid arthritis has been observed by many, and the writer is convinced that such glandular enlargement is fairly common in that disease. At the present time the writer has several cases of rheumatoid arthritis in adults under his care at hospital exhibiting enlargement of the lymphatic glands, while in one case there is in addition an enlargement of the spleen. Glandular enlargements are seen most typically in those cases of rheumatoid (infective) arthritis which occur in young women where the onset has taken place soon after parturition. Certainly enlargement of those glands is more commonly met with in children than in adults, a feature which may be accounted for on the hypothesis that all cases of rheumatoid arthritis are in reality cases of infective arthritis, and that children, as is well known, are more prone than adults to glandular enlargements when suffering from any infective or toxic condition. In the cases which are here quoted the presence of infective foci in several of the cases tends to bear out this contention.

True osteo-arthritis of the polyarticular variety is met with very rarely, if at all, in children. Cases so diagnosed which have come under the writer's notice have invariably turned out to be late cases of rheumatoid arthritis, when all signs of the acute phase, such as fusiform enlargement of the finger-joints, glandular swellings, etc., have subsided and given place to shrinkage of the synovial and other tissues, with consequent shrivelling up of the joints and deformities resulting from contracture of muscles and tendons. It must be borne in mind that these processes occur at a much greater rate than obtains in adults.

The most certain method of diagnosis in such cases of doubt is by means of skiagraphy. In several cases observed by the writer in which much difficulty presented itself in diagnosing the condition from clinical appearances alone, and where, indeed, these rather favoured the diagnosis of osteo-arthritis, the radiographs presented the appearances of the atrophic form of arthritis (*i.e.*, rheumatoid arthritis).

Etiology.—As regards causation, the same factors which are held to operate in determining the onset of cases of rheumatoid

arthritis in adults have been advanced as providing the necessary predisposing factors in children. Insanitary surroundings, insufficient nourishment, illness, such as the zymotic diseases, and, indeed, any condition which tends to lower the health and undermine the powers of resistance of the individual, without doubt play a part in most cases. In the following series of sixteen cases the condition seemed to follow directly on injury to the joint in two cases, while in four cases the onset followed a "chill" after getting wet. Heredity does not appear to play any part, so far as direct inheritance of the condition is concerned. In none of my cases had the father or mother suffered from rheumatoid arthritis. The writer has found that in a certain percentage of cases infective foci would appear to play as important a rôle in the etiology of rheumatoid arthritis in children as he believes obtains in adults. In the sixteen cases quoted in this paper infective foci were present in six cases contemporaneously with the onset. In many cases, however, as in adults, no definite exciting cause can be ascertained, the condition manifesting itself in children who were to all appearance in the best of health at the time of onset. It may be that in those cases of unknown origin there had existed some cryptic infective focus, but this is merely speculation.

The symmetrical nature of the joint involvement is also indicative of the condition being the result of some general toxic or bacterial agent. Still in his cases found that the onset was almost always prior to the second dentition. The observations of the writer would, however, appear to prove that there is no age limit to the occurrence of rheumatoid arthritis. In 200 consecutive cases of rheumatoid arthritis (as distinct from osteo-arthritis) which came under his observation the age of onset was determined.

Age of Onset.

	0-5.	5-10.	10-15.	15-20.	20-30.	30-40.	40-50	50-60.	60-70.	Total.
Males . .	Nil	2	2	2	13	13	7	Nil	Nil	39
Females . .	Nil	6	6	12	46	45	30	13	3	161
Total . .	Nil	8	8	14	59	58	37	13	3	200

In addition to the above, the writer saw a case which occurred in a boy of three years of age, which is, however, not included in

this series. From the above table it will be seen that while the age of onset is most frequently met with in the third, fourth, and fifth decades of life, yet there would appear to be no period of life which is exempt from the onset of this condition. In children, as in adults, there is a greater predilection for the female sex. This is borne out by the above series, and corroborates the figures of Garrod's hundred cases.

Onset.—No two cases would appear to begin in exactly the same manner. Generally in children the condition has a more sudden onset and course than in adults. It is generally diagnosed in the first instance as being rheumatic fever, acute tuberculosis of the joints, influenza, chill, or growing pains. There are in some cases short periods of quiescence between the exacerbations, when it may be thought that the condition has entirely subsided. We now look upon those as merely halting periods, at the end of which the condition pursues its relentless course. The persistence of the condition, however, serves to cause the original diagnosis of rheumatic fever or the other conditions above enumerated to be reconsidered. At the onset the patient usually suffers from a tired feeling and stiffness in one or more joints, which quickly invades others. Those most commonly first affected are the proximal interphalangeal joints of the fingers, the wrists, knees, and ankles. The cervical segment of the spine was an early point of attack in several of my cases, and in a few the involvement of the hips and shoulders took place early in the course of the disease. The following is a brief account of the mode of onset in the cases which are here under consideration :—

MODE OF ONSET.

CASE I.— D. C., female, age at onset 5½ years. (History obtained from mother.)—" We noticed, in the first place, that she could not sit down on anything low such as a hassock or kneel down without having pain in the knees. Then she complained that her shoes always hurt her. Then I noticed that the glands (inguinal) in both thighs were enlarging, and called the doctor's attention to it, as I thought it might be rupture. She had great pain in the knees at the time, which were red, swollen, and inflamed." At first the condition was diagnosed as tubercular disease of the joints, but later on, while in Guy's Hospital, was diagnosed as " Still's disease."

CASE II.—M. H., female, age at onset 7 years.—Condition began as the result of " catching cold " at school. Firstly had stiffness of neck (which has remained stiff ever since). Initial symptoms were simply "slight stiffness" in neck, elbows, feet, knees, and hands. At the

onset she was confined to bed for some weeks with fever and chills. While in hospital had purulent discharge from left ear, which was treated. There was also a severe condition of oral sepsis, with pus oozing out from the margins of the gums. The question of having a complete clearance of all her teeth was considered, but this was deferred on account of the low state of her general health, which prevented her having an anæsthetic.

CASE III.—A. A., male, age at onset 13 years.—While on an errand got wet right through. He did not change his clothes. That same night he had stiffness in both knees. Two or three days later the knees and ankles became painful. One week from the onset he took to bed. Two weeks from onset the wrists and fingers felt stiff, while in a day or two they became swollen and painful (but not reddened or hot). He was confined to bed for five months. The case was originally diagnosed as rheumatic fever. There was a history of intermittent attacks of epistaxis and purulent discharge from nostrils.

CASE IV.—S. J., female, age at onset $15\frac{1}{2}$ years.—Cause assigned—got wet one night. On the following evening had pain in the left shoulder. A few days later pain occurred in the left knee. The pain moved every night from one joint to another. Practically all the joints became affected at the first attack, and the proximal interphalangeal joints of the fingers have since remained spindle-shaped. The condition was originally diagnosed as subacute rheumatism.

CASE V.—F. W., female, age at onset 14 years.—Fell down stairs. "Water in the right knee" developed one week after the fall. One month later the hands became affected, then left foot. Was able to get about when foot was painful and to assist with house duties. Was never confined to bed.

CASE VI.—H. C., male, age at onset 9 years.—Onset with swelling and pain in right elbow. Mother stated that he knocked the elbow a day or two previously. The right elbow remained swollen and slightly painful during the following six months, being the only joint affected. At the end of this time both knee-joints became gradually swollen and painful, then proximal interphalangeal joints of right hand became fusiform ; other fingers, one by one, became similarly involved.

CASE VII.—M. D., female, age at onset 13 years.—Was in bed one week with "influenza." Then was up and about for two months. Then began to have pains flying all over body, at first chiefly in knees and ankles, but by the end of six months from onset nearly every joint had become affected. The knees and ankles remained swollen and subacutely painful for three years. From sixteen to twenty years of age she was almost well again. The condition then reasserted itself in the right ankle, and although the joint was swollen and painful she persisted in getting about for a week or so. Then all of a sudden the joints generally over the body became stiff and painful, and in three

weeks from this onset she was a helpless cripple. The case presents now the aspect of advanced rheumatoid arthritis. A persistent leucorrhœal discharge was attended to while in hospital.

CASE VIII.—E. L., female, age at onset 9 years.—Began with pain and swelling in the interphalangeal joints of both thumbs. Fingers did not become fully fusiform till she was twenty years of age. Practically all joints have been affected.

CASE IX.—L. M., female, age at onset 11 years.—Began with swelling and stiffness in wrists and fingers. Cause assigned by doctor was chill after bathing in cold water. Two months after onset the knees and shoulders became affected Since then (present age nineteen years), through a prolonged and insidious course, nearly every joint has been involved.

CASE X.—K. M., female, age at onset 13 years.—Began with stiffness in right hip, which in a few weeks became swollen and painful. No cause was assigned. Some months later both wrists became swollen, and the interphalangeal joints of several fingers became spindle-shaped and painful.

CASE XI.—M. L. W., male, age at onset 9 years.—Onset in right knee. On getting out of bed one morning the right knee seemed to be heavier than the other, and he could hardly raise the leg. There was pain in the knee on attempting to walk. The condition was diagnosed as rheumatic fever, and he was sent to bed, where he remained for three weeks. During this time the patient felt quite well, and the right knee remained the only joint affected. Three weeks from the onset the right wrist began to ache, followed a few days later by swelling in the wrist and knuckles. Two months later the right elbow became affected, and following on this both knees and ankles. He has had otorrhœa (from right ear) since he was six or seven years of age. This always returns whenever he is exposed to chills.

CASE XII.—G. D., male, age at onset 14 years.—Began with an attack of "acute rheumatic fever." For three weeks before this he had a tired, "laggish" feeling, then it settled in his knee-joints and ankles, and in a week or two had affected the fingers, elbows, and shoulders.

CASE XIII.—G. G., female, age at onset 12 years.—Began in left ankle-joint with swelling and a dull, aching feeling. Pain and swelling quickly invaded both wrists, interphalangeal joints of fingers and toes, ankles and knees. She had had a unilateral discharge from the nose for some time.

CASE XIV.—D. E., female, age at onset 5 years.—Onset followed immediately on an attack of measles. This left her with an unhealthy condition of the mucous membrane of the nose, from which there has been a constant slight muco-purulent discharge ever since. The condi-

tion began with stiffness and swelling (typically fusiform) in the elbows, fingers, and knees. Hips are also affected.

CASE XV.—D. P., male, age at onset 2 years.—Began with swelling, stiffness, and pain in wrists, ankles, knees, and cervical spine. Cause assigned—a chill from sitting on a damp bench. At the outset there was intermittent pyrexia and other signs of acute constitutional disturbances, *e.g.*, glandular enlargements, etc.

CASE XVI.—J. W. F., male, age at onset $8\frac{1}{2}$ years.—It was first noticed that after playing he used to get pains in the knees. This got so bad that at the end of three weeks he was unable to get about, and as the condition was diagnosed as rheumatic fever he was kept in bed. On returning home after a short holiday in the country, during which time the condition remained only in the knees, the fingers became affected, then the wrists, insteps, elbows, shoulders, and hips. Eighteen months ago (he is now eleven years of age) the temporo-maxillary joints became affected, and there was great difficulty in eating. This lasted for two months, and has now entirely subsided. On admission to hospital he was suffering from a severe degree of oral sepsis.

The distribution of joint involvement, while following the same tendency to a centripetal course as in adults, is more symmetrical, at any rate in the early stages. It may be said that all the clinical features of rheumatoid arthritis in children are prone to be more exaggerated than in adults, a feature which may be ascribed to the more rapid and complete development of the condition. As in the adult form, the joints are the chief centres of attack. These become spindle-shaped, a feature seen to best advantage in the proximal interphalangeal articulations of the fingers. This enlargement is entirely due to swelling of the soft structures in and around the joint, as will be seen from Plate I., the skiagraph showing a slight degree of density over the periarticular tissues. Early in the progress of the condition there is considerable limitation of movement of the affected joints. Pain in the joints is more or less present in all cases, and may vary from merely a stiff aching feeling to the most acute joint pain. The pain tends to cling persistently to the joints involved, and does not shift about from one joint to another. The pain, although distinctly due to changes in the joint, partakes more of the character of neuralgic pain. In a case which has run its course and in which the active agent may be said to have died out there only remains the wreckage resulting from the acuter stages. Here pain is lessened, and excepting on movement may be absent altogether. The swollen joints are reduced in size, and are gnarled and irregular in contour. Contracture deformity, seen most often as hyperflexion, may be presen
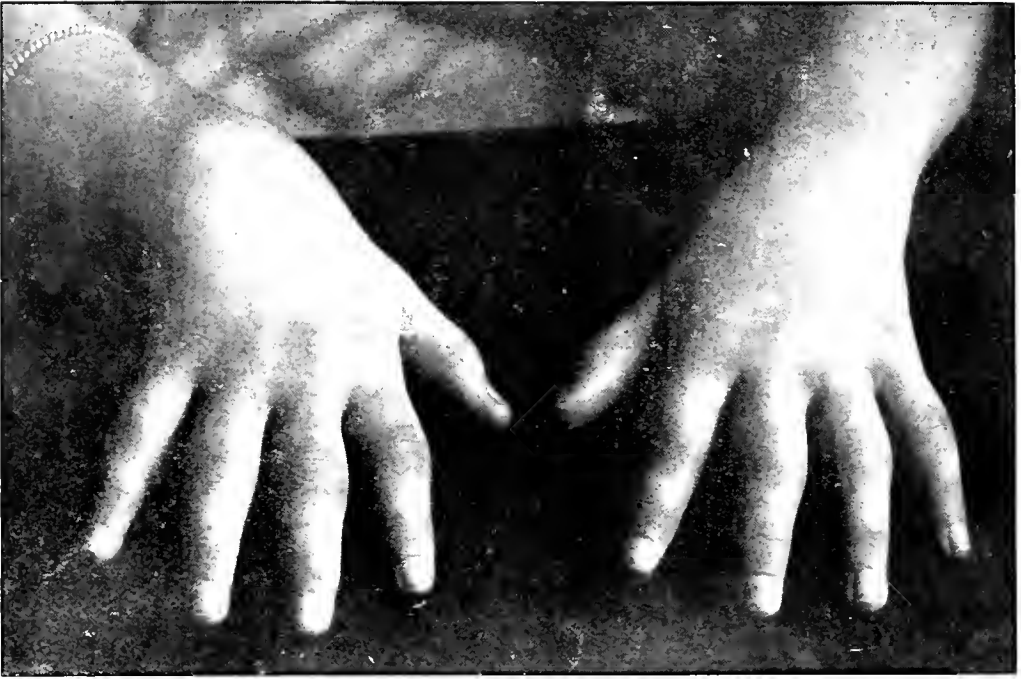
PLATE III.

Fig. 1. Photograph of the hands of a child with acute rheumatoid arthritis, showing the typical fusiform or spindle-shaped enlargement of the proximal inter-phalangeal joints. (Plate I. is the skiagraph of those hands.)

Fig. 2. Photograph of a girl the subject of rheumatoid arthritis in its subacute stage. The finger and other joints have undergone a process of shrinkage of the soft structures of the joints, and no longer present the smooth contour depicted in Fig. 1.

Fig. 3. Photograph showing the chronic stage of rheumatoid arthritis as seen in a child, in which there has occurred disorganisation of the joints with a marked degree of muscular atrophy and tendon contracture. (Plate II. is the skiagraph of the hands in this case.)

PLATE II.

Skiagraph of chronic rheumatoid arthritis in a child, showing that absorption of the inter-articular cartilages has occurred, also erosion of the articular ends of the bones. This skiagraph also shows the atrophic nature of the bony changes.

PLATE I.

Skiagraph of acute rheumatoid arthritis in a child, showing the marked translucency at the ends of the bones and demonstrating that the fusiform enlargement of the interphalangeal articulations is not due to bony enlargement but to swelling of the soft structures of the joint.

to an exceptional degree involving usually the finger, wrist, and knee joints (see Plate I.). These deformities are thrown into greater relief by the marked muscular wasting which exists. In Plate II., taken from a case which had run its course, there is obvious subluxation of the interphalangeal joints from tendon contracture, while, also, destruction of the interarticular cartilages, is seen.

Cutaneous Changes.—"Spender's spots" are seen on the skin in children with rheumatoid arthritis with much the same frequency as they are met with in adults. They occur mostly on the skin over the arms and face. Similarly those children are subject to localised sweatings, particularly in the palms and soles. The temperature is usually raised at the onset, and after prolonged afebrile periods the temperature again rises with each exacerbation. These rises in temperature are seen more frequently in children than in adults.

Vaso-motor disturbances allied to Raynaud's disease are met with in children as a prodromal symptom.

M. L. H., male, æt. 11 years, gave the following history :—For a month or so before the onset (2 years before admission) he remembered how the fingers as far as the knuckles would become white, numb, and "dead." On those occasions he was unable to tell when anyone moved his fingers, and for the time being lost all sensation in them. Each attack lasted for half-an-hour or so, then, passing through a stage of redness and tingling, returned to normal. These Raynaud-like symptoms have not reappeared since the onset of the joint symptoms.

Muscular Atrophy is a prominent feature. The wasting occurs at too early a stage to be due entirely to disuse. Without doubt the latter acts as a contributing factor later on in the progress of the condition, but the initial wasting must be put down to the "reflex atrophy" which has been described in connection with rheumatoid arthritis. In this and indeed in all other respects the muscular wasting follows on exactly the same lines as in adults, the groups of muscles most commonly picked out being the extensors of the arms and legs and the interossei of the hands. This selection of muscular groups would indicate that the atrophy is a result of central changes. The pronounced nature of the muscular atrophy is well seen in the accompanying photograph (Plate III.), where also the typical humped deformity of the wrist is well marked.

Tendon Contracture appears early, and it is to this factor more

than to any other changes in the joint structures that we must ascribe the early and marked distortion of the fingers, the elbow ankle, and knee joints.

The Reflexes remain present throughout all stages of the condition. The writer has observed that in the majority of cases they tend to be slightly exaggerated.

Skiagraphy.—In all cases it was observed that there was a rarefaction of the bones in the vicinity of the joints affected (Plate I.). Very probably this is due to the thinning out of the cancellous tissue which is found post mortem. Kienbock has observed this same rarefaction in cases of gonorrhœal arthritis, while the writer has also been unable to distinguish between the skiagraphs of polyarticular arthritis due to gonorrhœal infection and skiagrams of other cases of polyarthritis. This thinning out of the shafts in the vicinity of the articular ends of the bones has been stated, however, to occur even in the normal hand, so that the true diagnostic significance of this sign has not yet been fully determined. X-rays, however, prove conclusively the non-osteo-arthritic character of the ends of the bones in this condition. In the early stages the articular surfaces, of the bones are unaltered, while the "atrophic" condition of the shafts is rendered evident. The irregularity of the articular surfaces, as seen in Plate II., taken from an old-standing case of rheumatoid arthritis in a child, is not to be confused with osteo-arthritic outgrowths, but is in reality an atrophic process resulting from a mechanical compression on the cartilaginous and bony surfaces by the hypertrophied synovial fringes, a condition first pointed out by Max Schuller.

Enlargement of the Spleen and Lymphatic Glands, as has been mentioned, forms an important feature in the physical signs of this condition. Most recent observers, however, in describing the adult form, mention the existence of glandular enlargements. In the experience of the writer enlargement of the lymphatic glands is present at some time or another in the majority of children suffering from rheumatoid arthritis. The glands are discrete and non-adherent. They are generally small in size, varying from the size of a pea to that of a bean, but may be considerably larger. They never proceed to suppuration. They are said to occur along the line draining the area which comprises the joints affected, but it may be that these glandular enlargements are due to a general toxic state. The involvement of the spleen tends to support this view. It has been remarked, however, that as soon as the joint condition has subsided the glands diminish in size, and may later

disappear entirely. The spleen is sometimes also found to be enlarged, but as the writer has also observed this organ to be enlarged in cases of rheumatoid arthritis in adults (where also there was enlargement of lymphatic glands), it would not, therefore, appear to be pathognomonic of the condition as it occurs in children. There does not seem to be any definite rule as to the groups of glands which become enlarged. The joints all over the body may be apparently equally affected, and yet only one gland or group of glands may be enlarged. In my series the following were the facts relating to splenic and lymphatic glandular enlargement :—

	Spleen.	Lymphatic Glands.	Joints Affected.
CASE 1. D. C.	(When in Guy's Hospital spleen was enlarged.)	...	Both knees, wrists, all fingers, both temporo-maxillary, cervical joints.
CASE 2. M. H.	...	Submaxillary.	Cervical joints, both elbows, feet, knees, wrists, all fingers.
CASE 3. A. A.	...	...	Fingers fusiform, wrists much swollen, both shoulders, knees and ankles, right hip.
CASE 4. S. J.	...	...	Completely crippled, only joints not involved being spine, hips, and toes.
CASE 5. F. W.	...	Inguinal (R. and L.).	Index and middle fingers L. hand fusiform ; elbows, shoulders ; toes, both feet, fusiform ; both ankles (much swollen), both knees ; hips slightly stiff, both wrists.
CASE 6. H. C.	...	R. Epitrochlear.	Both knees, all fingers, sup. radio-ulnar.
CASE 7. M. D.	...	Cervical, R. Epitrochlear.	Practically all joints, including temporo-maxillary and cervical.
CASE 8. E. L.	...	...	Fusiform fingers, knees, ankles, wrists, temporo-maxillary.
CASE 9. L. M.	...	...	Wrists, fingers, knees, shoulders, temporo-maxillary.

	Spleen.	Lymphatic Glands.	Joints Affected.
CASE 10. K. M.	...	R. Axilla (One large gland).	Both wrists, all fingers, elbows slightly.
CASE 11. M. L. W.	...	...	Knees, ankles, fingers.
CASE 12. G. D.	...	Epitrochlear (R. and L.).	Both hands, wrists, elbows, shoulders, ankles, knees.
CASE 13. G. G.	...	...	Ankles, all fingers, wrists, elbows, toes, knees.
CASE 14. D. E.	...	Axillary (R. and L.).	Elbows (acutely), knees, and hips.
CASE 15. D. P.	Enlarged.	Both axillary and inguinal.	Wrists, fingers, elbows, shoulders, ankles, feet, knees, cervical spine.
CASE 16. J. W. F.	...	Epitrochlear (R. and L.).	Fingers, wrists, elbows, shoulders, feet, knees, temporo-maxillary.

Morbid Anatomy.—By comparing the post-mortem appearances described by Hale White in an adult case with Still's in those of children we are led to believe that there is no difference in the morbid anatomy. The former found the following conditions in the joints of a young woman :—

Periarticular fibrous and ligamentous thickening, all the soft structures of the joints swollen and injected, an increase in the amount of synovial fluid. The articular cartilages, beyond a slight erosion, were unaltered; the bones were unaltered.

Still found in a child that :—

The joints were markedly enlarged; increased vascularity of synovial membrane and ligaments, thickening of capsule, and slight increase of synovial fluid.

In another case he found in addition to the above changes some pitting of the articular cartilage at its margin, giving it in parts a worm-eaten appearance, little processes of thickened synovial membrane fitting accurately into the pits. Thus the changes in the cartilage seemed to be secondary to the changes in the synovial membrane.

Prognosis.—The outlook in this condition, though very distressing, is not without hope. When the subject was first brought prominently before our notice the worst possible prognosis was indicated, no case of recovery having at that time been

described. Later observers, however, while acknowledging the relentless nature of the condition, are able here and there to bring forward a case of recovery. The following case, being that of a very acute and severe type, was arrested and greatly improved by treatment :—

D. P., aged 2 years, was admitted to the Royal Mineral Water Hospital suffering from pain, swelling, and stiffness of the wrists, ankles, knees, and the cervical portion of the spine. There was intermittent pyrexia, enlargement of the lymphatic glands in the axillary and inguinal regions, while the spleen was also felt below the costal margin. By the time of his second admission to the hospital one year later the acute nature of the condition had to a large extent subsided ; there was no fever, the spleen was not palpable, there were some small pea-like glands in the inguinal regions which were not tender on pressure. There was swelling and puffiness of the ankles, the wrists and neck were stiff. He was able to get about. The stiffened joints were subjected to gentle passive movements many times daily, and voluntary movements of the affected joints encouraged, the results being most satisfactory, the boy leaving the hospital in a much improved state.

There is more hope in those cases which begin with acute attacks with swelling of joints, raised temperature, rapid pulse, and other constitutional disturbances. For one reason these cases come under notice very early in the course of the disease, while also in such cases we are more likely to find an infective focus, and if treatment is directed to such a point we may look with more confidence to a speedy relief of the condition. Of graver import are those cases which begin insidiously, and, while perhaps at no time developing any constitutional symptoms, pursue a slowly progressive course to complete crippledom.

Treatment.—The treatment will of necessity vary according to the stage and intensity of the condition. All cases at their onset ought to be kept in bed, this being the obvious line to follow in the more acute stages with painful joints and constitutional disturbances. Complete rest of the affected joints in all cases is essential during the early stages. Rest alone will give more relief to the pain in the joints than any local applications or general medicinal treatment. Even those cases with insidious onsets should be rested, as it can hardly be doubted that getting about on joints subacutely affected is harmful and prolongs the attack on the joint. If possible, as soon as the case is diagnosed, and if the means of the parents permit, such children ought

to be taken to some part of the country which most closely approximates to the ideal climate—dry, warm, equable, inland, preferably highly situated and well sheltered. It is disastrous to allow such children to be subjected to damp and to wide variations of temperature.

Diet.—During the febrile stages the patient should be kept on a milk diet. In all other stages the diet should be a generous one. Such children ought to be fed up to the limits of their digestive powers. Cream, butter, and other fatty foods are particularly indicated, and are well borne.

Medicinal Remedies.—There is no specific. Guaiacol carbonic, gr. 5, t.i.d., administered over a period of several months at a time, is considered by many to do good. Syr. ferr. iodid. is another useful drug. The salicylate group is very uncertain in its action. In some of the more acute cases, however, salicylates seem to cut short the attack and relieve the arthritic pain. Aceto-salicylic acid, in small doses of 3 to 5 grs. t.i.d., or oftener on painful days, is a favourite remedy, but should not be employed over a long period of time. General tonics are frequently indicated, as these patients are so often in a low state of health.

Local Applications to the affected joints, such as oil of wintergreen, iodex, lin. pot. iodid. c̄. saponē, are useful in the various forms of joint stiffness and pain. The writer has had some experience of Bier's congestive treatment of joints in this condition, using elastic-webbing bandage around the limb proximate to the joints affected. In one case the result was exceedingly satisfactory. Here, where there is such marked atrophy of muscles appearing even in the early stages of the complaint, it is of benefit to begin massage as soon as there are any signs of muscular wasting. The writer believes it to be indicated even where there are slight constitutional disturbances of temperature, etc., where in ordinary practice massage would not be resorted to. This ought to be carried out under strict medical supervision. The massage must be given very gently, and only over the selected areas where wasting occurs over muscles, either singly or in small groups. Care would be exercised not to interfere with acutely inflamed joints. If massage can be carried out several times each week it ought to be done, but would, of course, be discontinued if the manipulations affected the patient adversely in any way. The results obtained may not be very obvious, but will in all probability do much to avert the very great wasting and contracture deformities which are so distressing a feature in advanced

neglected cases. In the later stages, in order to prevent undue stiffness of the joints, passive movements ought to be carried out. These movements ought invariably to be performed by a masseuse who can be trusted not to apply any force. All movements must be done gently, and must cease instantly should any signs of inflammation in the joints manifest themselves.

Spa Treatment.—These cases generally find their way to spas. Cases, however, while still in the acute stages can be treated quite as well at home, where rest in bed and ordinary medical treatment is alone available. It is more especially in the later stages, after all acute manifestations have subsided, that the maximum benefit accrues from spa treatment. Generally speaking, the benefits are derived not so much from any inherent merits in the waters themselves as from the more thorough and systematic treatment such patients receive. Questions of diet, fresh air, exercise when possible, receive more direct attention, while the more thorough douching, massaging, packing at the baths, and the application of electro-therapeutics all produce good results. Aix-massage, as practised at Bath, Buxton, and Harrogate, is of especial benefit in the later stages. Vapour (Berthollet system) baths give relief to the pain and contraction so often present in those cases, and as these baths are rather exhausting to children they are generally applied locally only. Benefit may also be got from local treatment by electric hot air applied either on the Greville or Dowsing systems.

The question of operative procedure in order to break down adhesions and correct contracture deformities is still *sub judice*. Such surgical interference as arthrectomies, tenotomies, etc., in order to correct deformities and render limbs of more use, may be considered advisable in the later stages when the condition has run its course. The writer has on several occasions attempted to reduce deformities by straightening out the limbs while the patient was under the influence of a general anaesthetic. In each case the contractures were easily overcome, and remained so while the patient was anaesthetised, but in each case the condition returned to its former as soon as the anaesthetic influence had been removed. In such cases it does not appear to be of any avail to apply splints, as even after a considerable interval the contracture returns to its former state on their removal. No case has been properly investigated unless search has been made for some infective focus. A systematic examination of all the orifices of the body—the mouth, nose, ears, rectum, and vagina—ought

to be made in each case. If anything is found, attention ought to be directed at once to such centres, and the infective focus eradicated, and if possible a vaccine ought to be prepared from the discharge and administered to the patient.

RE-FORMATION OF BONE AFTER RESECTION.*

By GEORGE A. PIRIE, M.A., M.D.,

Hon. Medical Electrician to the Dundee Royal Infirmary.

CASES of tubercular osteomyelitis of the long bones are not common. Out of 8800 patients examined by the X-rays during the past five years in the Dundee Royal Infirmary I have noted 50 as suffering from this disease. Sometimes the whole shaft of a humerus was found diseased, sometimes only a few inches at the extremity of a radius or a fibula. The radiogram furnished all the required information as to extent of bone affected, and resection was usually performed at once by the surgeon in charge of the case.

The subsequent history as revealed by X-ray examination was most interesting, as the re-formation of bone to take the place of the part removed could be seen stage by stage until it was so far complete as to permit of the limb being used again.

Notes of two cases may here be given :—

CASE I.—D. M., schoolboy, aged 7, complained of his left leg above the ankle. It had been sore for three months. X-ray examination showed the lower end of the tibia affected with osteomyelitis for nearly 4 inches above the epiphysis, which was normal. The fibula showed signs of periostitis. Resection was performed, four inches of the lower end of the shaft of the tibia being removed. Five weeks later X-ray examination showed very complete regrowth of bone filling the gap at the lower end of the tibia and fairly normal in shape. The boy was therefore allowed to use his legs, but the new bone was soft, and bent a little. Three and a half years later the X-rays showed complete restoration of bone, slightly bent just above the epiphysis, which had developed normally. The fibula had recovered from its periostitis, and presented quite a normal appearance.

The boy can now use his limbs perfectly. (See Figs. 2, 3, 4.)

CASE II.—A. G., schoolgirl, aged 15, sprained her ankle. A year later it was examined by the X-rays. The lower end of the tibia was much enlarged for 4 inches above the epiphysis. The fibula was normal. Resection was performed by Mr. Price, the lower 4½ inches of the shaft

FIG. 1.—D. M. Left leg. Five weeks after resection of lower end of tibia. 4th September 1905.

FIG. 2.—D. M. Left leg. Five weeks after resection of lower end of tibia. 4th September 1905.

FIG. 4.—D. M. Left leg. 3½ years after resection of lower end of tibia. 1st March 1913.

of the tibia being removed. Every three months thereafter the limb was examined by the X-rays. New bone made its appearance, but so slowly and imperfectly that the girl was not allowed to use the limb for nearly two years. Then, while going on crutches, she fell and fractured the newly-formed bone about 3 inches above the ankle. Immediately the re-formation of bone proceeded actively, not only at the seat of fracture but throughout the length of the new bone, which was soon thick enough to permit of the limb being used.

She can now walk freely. (See Fig. 1.)

These cases present several points of interest. In the first the bone was restored in 5 weeks, whereas in the second an interval of 2 years elapsed before sufficient bone had been formed to bear the weight of the body.

In a few cases (*e.g.*, where the upper end of the fibula was removed) there was no attempt at re-formation of bone.

It is therefore of great practical importance to inquire— (1) Whence is the new bone formed? (2) How may its formation be hastened? (3) How may the most perfect result be obtained?

The origin of the new bone has been the subject of a series of experiments on dogs carried out by Sir William Macewen, and his conclusion is that the osteoblasts which manufacture the bony material escape from the cut ends of the bone, and that the periosteum takes no part in osteogenesis; it is merely a limiting membrane.

Some of his experiments may be thus sketched:—

1. Remove a strip of periosteum: the bone continues to live and grow.

2. Remove an inch or two from the shaft: bone will grow from each cut end and meet in the middle.

3. Remove the whole diaphysis, but leave the epiphyseal plates uninjured: bone will grow as before and fill the gap.

4. Remove shaft and both epiphyses: no growth of bone occurs.

5. After removing the shaft insert the shaft of another bone recently removed: it will continue to live, and new bone will grow at the ends till the whole forms a useful limb.

6. After removing the shaft insert bone shavings recently taken from another animal: they will live and produce new bone till a mass of bony material is formed capable of bearing any ordinary strain.

7. Instead of bone shavings, bone dust was tried, but no growth occurred.

These experiments also furnish an answer to the question— How may the formation of new bone be hastened? (1) By pre-

serving intact the epiphyseal plates of cartilage.   (2) By inserting
in the gap, chips or shavings of bone recently removed—for
example from a femur in a case of genu valgum.

There remains only one question to answer—How may the
most perfect result be obtained ?   (1) By preserving the periosteum
as a limiting membrane; this allows of the new bone acquiring a
normal shape.   (2) By keeping the limb at rest and free from
pressure or stress of any kind; this prevents bending or twisting
the new bone.   (3) Lastly, if the process of repair is unduly slow,
arrange to have the new bone fractured, when the required
stimulus will at once hasten the manufacture of osseous material
and produce a useful limb.

NEPHRITIS, WITH ASCITES, BILATERAL HYDRO-THORAX AND GENERAL ŒDEMA, IN SECONDARY SYPHILIS.

By F. PARKES WEBER, M.D., F.R.C.P.

THE patient,* K. H., aged 22 years, a well-built and well-nourished
young man, a German waiter in London, was admitted to the German
Hospital on 29th December 1911.   Four months before admission he
had had a primary syphilitic chancre on the penis, and he had been
treated by intra-gluteal mercurial injections.   Ten days before admis-
sion the signs of nephritis had been noticed by the doctor who was
treating him.   No secondary syphilitic eruption had been observed.
In the hospital, after admission, the patient felt fairly well, but he had
slight ascites and œdema of the sacral region.   The urine varied from
600 c.c. to 1200 c.c. per diem, and was of high specific gravity (1·024 to
1·033) and very rich in albumin.   By Esbach's tube the albumin was
estimated at about 22 per mille (25 per mille on the day of admission);
there was no sugar; microscopical examination of the centrifuge
sediment showed the presence of hyaline tube-casts (containing also
granules), but no real granular or epithelial casts, and no blood ; there
were a few epithelial and white cells.   Reflexes normal.   Ophthalmo-
scopic examination showed nothing special.   Condition of the teeth
and gums good.   Pulse (on admission) about 84 per minute.   The
temperature chart showed slight rises, but not up to 100° F.   The blood
serum (1st January 1912) gave a positive Wassermann reaction for
syphilis (Lister Institute).   There was nothing abnormal in the thorax,
or, by palpation, in the abdomen.   The arterial blood pressure was low ;
on admission the brachial systolic pressure was about 100 mm. Hg. ; on
18th January only 88 mm. Hg.   A striking feature of the case, as in

* The patient was shown at the Clinical Section of the Royal Society of
Medicine on 14th February 1913.

typical severe cases of (very early or) secondary syphilitic nephritis, was the very large amount of albumin in the urine. On the 7th January the patient passed 1100 c.c. of urine containing 40 per mille of albumin. On 25th January he passed 400 c.c. of urine with 48 per mille albumin. Later on, between 8th February and 22nd February, the urine averaged about 2000 c.c. per diem, and contained from 4 to 12 per mille albumin. Blood examination (27th February 1912)—Hæmoglobin, 78 per cent.; red cells, 4,900,000, and white cells, 11,500, to the cubic millimetre of blood; nothing special by microscopical examination of stained films. In the second half of January, and for a long time afterwards, there was general dropsy with ascites and bilateral hydrothorax; the latter condition needed occasional paracentesis, especially on the left side. Blood examination (25th April 1912)—Hæmoglobin, 70 per cent.; red cells, 3,880,000, and white cells, 5600, in the cubic millimetre of blood. There was decided improvement in the patient's condition about April, though for a time he had a little pyrexia, of uncertain origin. In the second half of April it was noted that the urine (about 1500 c.c. in twenty-four hours) contained about 10 per mille albumin. In July there was a little pyrexia again. The left pleura was tapped for the two last times in September, on which occasions respectively 1550 c.c. and 550 c.c. of nearly clear fluid were withdrawn. By 7th October the patient was up most of the day. He looked well and had no ascites or general œdema, but there was still considerable dulness at the base of the left lung. The urine averaged about 2300 c.c. per diem, containing about 4 to 6 per mille albumin. On 16th November it was noted that the urine for the past week averaged about 2370 c.c. per diem (specific gravity about 1010), with only about 2 per mille of albumin. The systolic brachial blood pressure was then 90 mm. Hg. No ocular complication was ever noted.

The patient was discharged on 20th December 1912. There was still a great deal of dulness at the base of the left lung, apparently due to thickened pleura. The urine then averaged about 2500 c.c. per diem (specific gravity about 1·011), with 2 per mille albumin. Heart not obviously hypertrophied. Pulse, 80 to 96 per minute. Brachial systolic blood pressure, 95 to 100 mm. Hg. No tube-casts were found when the urine was microscopically examined before he left the hospital. He is now employed as a waiter at a restaurant, and feels well in spite of long daily hours at work. There is considerable dulness and contraction of the lower left part of the thorax, and the urine (27th January 1913), which is clear and of specific gravity 1·011, contains 4½ per mille albumin; microscopic examination of the scanty centrifuge sediment shows a few red blood corpuscles and white cells, but no tube-casts. The blood serum, when tested again (Lister Institute) in December 1912, gave a negative Wassermann's reaction for syphilis.

The treatment adopted at first was chiefly the ordinary treatment for acute nephritis. For a time either strophanthus or digitalis was given, with or without diuretin, or else diuretin by itself. For nearly all the time from the end of April to the end of December 1912 he was given a tablespoonful of liquor ferri et ammonii acetatis, three times daily, after meals. It is not certain that a "salt-poor" diet did much good in this case. For some days when an ordinary amount of common salt was allowed (March 1912) the patient passed less urine, with a higher percentage of albumin, than when he was having "salt-poor" diet.

Very little special anti-syphilitic treatment was attempted. A mixture containing perchloride of mercury and iodide of potassium was soon discontinued on account of diarrhœa. Two small intravenous injections of the original salvarsan (0·1 and 0·2 grm. respectively) were given in January 1912.

The existence of a really syphilitic parenchymatous nephritis occurring in the primary and secondary stages of the affection was formerly much disputed; but recent observations, especially on the Continent, have made it certain that genuine cases of the kind do occur. I would compare such genuine cases to cases of secondary syphilitic affection of the liver, including several instances of fatal icterus gravis with acute hepatic atrophy, occurring during the secondary stage of syphilis, like the one which I brought before the Pathological Section of the Royal Society of Medicine in January 1909.[1]

The present case resembled typical examples of severe secondary (or early) syphilitic nephritis in regard to the very large amount of albumin at first present in the urine. In January 1912 the albumin reached 48 per mille, as measured by Esbach's tube; in a case of early syphilitic nephritis related by E. Hoffman[2] it reached 70 to 85 per mille, and I believe still higher figures are on record. The urine in the present case was not examined, as was the patient's blood-serum, for Wassermann's reaction. According to R. Bauer and others very albuminous urine from syphilitic patients will give a positive Wassermann's reaction.[3] But it is doubtful whether a positive Wassermann's reaction from a patient's urine can be relied on as a diagnostic criterion of the presence of syphilis, still less so as a criterion that a nephritis from which a patient is suffering, even supposing him to be a syphilitic patient (with old or recent syphilis), is of genuinely syphilitic nature. The *Spirochæta pallida* has apparently been shown to be present in the urine of some cases of secondary syphilitic nephritis, and Vorpahl[4] claims to have lately succeeded in detecting this patho-

genic organism in the urine from a case of tertiary syphilitic nephritis. Certain it is that typical cases of early syphilitic nephritis are not the result of mercurial treatment, for in some such cases no mercury had been employed before the onset of the albuminuria.

On the whole, I think that the present case was really one of secondary or early syphilitic nephritis, and not merely one of nephritis in the course of syphilis. As the nephritis developed so soon after the primary affection, and as no ordinary secondary manifestations of syphilis were observed, the renal affection in this case ought perhaps to be termed "early" syphilitic nephritis ("nephritis syphilitica præcox") rather than "secondary" syphilitic nephritis. A question which suggests itself, but which I shall not attempt to answer, is whether the patient's continued low blood pressure was in any way responsible for the gravity and chronicity of the nephritis.

Opinions are still divided as to the advisability of treatment by mercury or salvarsan in such cases. In a late syphilitic patient with nephritis and positive Wassermann's reaction I have once had a disastrous result from the use of mercury, and Caussade and Regnard[5] recorded a death from anuria following an intravenous injection of salvarsan (0·3 grm.) for late syphilitic nephritis. In the present early syphilitic case I think that more energetic treatment than was attempted by mercury or salvarsan would have been highly dangerous. On the other hand, excellent results have been obtained from mercury or salvarsan in quite a considerable number of published cases of syphilitic, chiefly early syphilitic, nephritis, and A. Gouget,[6] in a summary on the use of salvarsan in syphilitic nephritis, refuses to admit the salvarsan as the cause of death in the case recorded by Caussade and Regnard, which, he points out, was a most unfavourable case from every point of view.

The effects of mercurial treatment on the kidneys and urine have been carefully studied by E. Welander (accounts in various articles by him) and others, but one is hardly likely to see mercurial treatment adopted for nephritic patients unless they likewise have syphilis. Some time ago a man, aged 22 years, was admitted under my care with nephritis and secondary syphilis. From the history obtained it seemed that the renal disease dated from three years back, whilst the patient had contracted primary syphilis only six months or so ago. At least two years before admission he had had œdema at the ankles. On admission

the urine contained very much albumin, hyaline and granular casts, and white and red blood cells. He had general enlargement of the superficial lymphatic glands, the remains of the primary chancre on the penis, the remains of secondary syphilitic eruption on the body, and secondary syphilitic signs in the fauces. Mercurial treatment (temporarily discontinued for gingivitis), Zittmann's decoction, rest in bed, milk diet, hot baths, etc., were employed, and when the patient left the hospital (a little more than two months after his admission) he was apparently free from any active syphilitic trouble, but the treatment had made little or no difference to his renal condition.

There is no doubt, however, that in some cases mercurial treatment has very bad effects, and extreme caution is required when it is being tried.

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TRANSACTIONS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held on 5th March 1913, Mr. J. M. Cotterill, President, in the chair.

Mr. J. W. Struthers showed an adult male suffering from a small *actinomycotic lesion* in the right cheek. It had reached its height in a week, and persisted as a chronic inflammation for 6 months. Great improvement was taking place under the administration of potassium iodide.

Professor Caird gave a communication on "*Carcinoma of the Rectum,*" and showed lantern slides of preparations.

He had dealt with 43 cases. Most were males between the age of 40 and 60. Very few cases had a short history. The average duration of complaint was 6 months, a figure which closely corresponded to the duration of the history in cancer of the stomach, although in cancer of the rectum the diagnosis generally lay within reach of the finger. In most cases hæmorrhage was the chief or only symptom. In no case was there prolapse or piles. Pain was present in rather more than half the cases. The pain was either complained of as occurring during defæcation or as a constant dull pain over the sacrum. Irregularities in defæcation were not common, and pipe-stem stools were rare. In only 4 cases was there irregularity in connection with micturition. In only one case was there difficulty in diagnosis, and it was found that the sigmoidoscope failed to pass. The commonest site of tumour was $2\frac{1}{2}$ ins. up the rectum, and the next commonest just within the anus. The digital examination should be made when the patient is straining. In removal,

colostomy offered no advantage unless there was difficulty in emptying the bowel. The Kraske operation seemed the ideal, but the reality was often far short of the ideal. It was difficult to get wide enough removal, and primary union did not occur, with the result that faecal fistula and stricture followed. The perineal incision, aided, if need be, by parasacral incision, was probably best, and it allowed implantation of the anus in a somewhat natural site. The combined abdomino-perineal operation allowed glandular infection to be dealt with, and the liver could be examined for nodules.

The President remarked that the perineal was probably the best operation, and that the abdomino-perineal operation was seldom called for, and was not easily carried out with safety.

Mr. Wallace said it was yet a matter of doubt what should be done in cases of carcinoma of the rectum. The question was one of technique. How were the best immediate and ultimate results to be obtained? The great barrier to success was the difficulty in getting the anus to functionate. He thought it a mistake to attempt to get a functionating anus in the perineal position. He preferred to make an inguinal anus as a first step, and then to remove the disease widely without expectation of getting a functionating anus in the perineum. He thought this course would lead to greater success both immediate and remote. In cases which were too late for an attempt to be made to remove the disease colotomy was of service. He had known cases live for years in comfort after colostomy. He thought that in the minds of the public, physicians, and some surgeons there was an idea that colostomy entailed great discomfort. As a matter of fact many patients acquired considerable control over an inguinal opening. Colostomy was of value in itself, and was good practice, inasmuch as it enabled complete removal of the disease to be effected with less risk of pneumonia or other danger supervening. The perineal or Kraske operation might be done as seemed preferable, but even the combined abdomino-perineal operation would be more successful if colostomy were first performed.

Mr. Stiles said that some of the cases were not easily diagnosed. He preferred to examine the rectum with the patient in the knee-elbow position. Sometimes when the patient strained, the tumour could just be felt impinging on the finger. The diagnosis could then be confirmed by the sigmoidoscope. The exploring finger could not reach beyond 4 ins. He strongly advocated beginning treatment by performing inguinal colostomy. This allowed the intestine to be cleared, and the dirty septic surface could be washed through. If subsequent procedure were deferred for 3 or 4 weeks patients greatly improved. This greatly diminished mortality from sepsis and long convalescence. The anus should be closed and access obtained to the tumour by removal of the coccyx, and, if need be, of the lower segment of the sacrum. The anterior wall of the rectum was pulled towards the apex of the prostate and membranous urethra by the urethra-rectalis muscle. There might be great ballooning of the rectum, but the recto-vesical fascia stripped easily. When the lower end of the pelvic colon was freed there was no need to bring it to the sacral region. There was better control in the inguinal region, and the colon might be closed. The wound should be drained, and healing occurred in 5 or 6 weeks without sepsis or pneumonia or so called delayed shock. The combined operation was rarely called for, but permitted the clearing out of fat.

Professor Alexis Thomson said it was important to recognise that surgeons

could cure cancer of the rectum. A few years ago American surgeons had given up removal in favour of colotomy. He agreed that the inguinal was the preferable site for an artificial anus.

Dr. Brown Darling said he had attended a case for 12 years after inguinal colotomy, and death had occurred at the age of 73 from gangrene of the arm.

Mr. Caird in reply said that of the 43 cases 8 had died after the operation. Most of the deaths were due to such causes as œdema of the lungs. The end of a case where colostomy alone was done was death from the disease. After a radical operation patients died of many other affections. Colostomy had to be performed where the disease could not be attacked from below, but there was nothing to choose between two disagreeables in the perineal or inguinal anus. After clearing out the base of the pelvis the bringing down of the colon to the perineum helped to fill in the gap.

Dr. Dawson Turner gave a communication and lantern demonstration on "*Cases Treated by Radium in the Royal Infirmary of Edinburgh during* 1912." Forty-one cases had attended. Very successful results had been attained in angiomas and rodent ulcers. Radium was superior to CO^2 snow in penetrating more deeply, in being painless, and in leaving good cosmetic results. A condition of leukoplakia had been held in check, a case of spring catarrh of the eye had been cured, but a case of Hodgkin's disease had not been influenced. Several cases of malignant disease had greatly improved.

Forfarshire Medical Association.

A MEETING of this Association was held on 13th March in the Conjoint School of Medicine, Dundee. Dr. J. S. Y. Rogers, Vice-President, occupied the chair.

Professor C. R. Marshall introduced the subject, "A General Discussion on the *Salvarsan Treatment of Syphilis*, with Individual Clinical Records of its Administration and Use," with an account of the chemical constitution and the introduction of the drug, and Dr. F. M. Milne followed with a short description of the methods of diagnosis employed in syphilis, with special reference to the Wassermann reaction.

Mr. Greig quoted a number of cases from his records, and from his experience with the drug stated his conclusions. Salvarsan should be injected intravenously, and not a drop of the fluid containing it should escape into the surrounding tissue. Intra-muscular injection is unsatisfactory, as it causes an incredible amount of pain, and the subsequent necrosis of tissue renders absorption of the drug uncertain. It acts best when a maximum dose is given, and when no arsenic is given in the intervals between injections. The administration of salvarsan ought to be guided by the modern methods of diagnosis, and particularly by the Wassermann reaction. In syphilis salvarsan should be regarded as an adjuvant to mercury, and its use should be at once followed by a course of mercurial treatment. In secondary syphilis salvarsan is *facile princeps*.

Professor Stalker described a case of transverse myelitis, in which salvarsan had restored the patient to a practically normal state of health.

Mr. Don referred to the mortality that was said to follow its employment.

Dr. J. Mackie Whyte referred to the statement of Gowers that syphilis is incurable, and mentioned that the results of treatment will be seen ten or fifteen years hence in cases of tabes or general paralysis of the insane.

Dr. Tulloch said that in 33 years' experience with mercurial treatment he had found it unsatisfactory in only six or eight cases.

Mr. J. Anderson, who had administered salvarsan in 121 cases, had found that the primary sore disappeared in ten days on an average after injection. He had had one case of reinfection. With regard to the safety of the use of salvarsan, he mentioned Major Harrison's figures that the mortality was less than 1 in 1000 in a series of 40,000 cases.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., AND JOHN D. COMRIE, M.D.

AURICULAR FLUTTER.

SEVERAL further instances of this disorder of the heart's action, which was described in the December number of this Journal, have now been narrated. Lewis (*Heart*, 1912, iv. 171) discusses eight new cases:— (1) a woman of 50 years who had an attack of tachycardia lasting probably for three months. The rate of the rhythmic auricular contractions exceeded 300 per minute, the highest count being 324, while the ventricles usually responded to alternate auricular beats. (2) Male, aged 65, who had been subject to attacks of tachycardia with a ventricular rate of 110 to 150 for thirty years. In his last attack, which persisted for five months, the auricular and ventricular rates were 280 and 140 respectively. The patient died about a month later. (3) Male, aged 53, who had been liable to attacks of palpitation and tachycardia for thirty-eight years, and in whom the rapid action had been persistent for three years. The auricular rate varied from 264 to 321 per minute, while the ventricular rate was one-half that of the auricles. (4) A man, aged 62, who developed a continuously rapid heart action during a severe attack of influenza, had an auricular rate of 270 and a ventricular rate of 135 per minute. (5) A man, aged 60, with auricular and ventricular rates of 300 and 150 respectively. (6) Actor, aged 17, in whom the auricles beat at a rate of 350 per minute. (7) An elderly gentleman with auricular and ventricular rates of 228 and 114 respectively. (8) A man, aged 52, in whom the auricular rate was 260, while the ventricular rate varied from 90 to 130.

The case reported by Hume (*Quart. Journ. Med.*, 1913, vi. 235) was a labourer, aged 63, suffering from dyspnœa and vertigo, and presenting the physical signs of mitral incompetence. At the root of the neck it was noted that there were very rapid pulsations which appeared to be at least three times as rapid as the radial pulse, and

tracings showed that the auricles were beating rhythmically 260 times per minute, while the radial pulse was only 87, there being 3 : 1 heart-block. By means of digitalis the ventricular rate was easily retarded, and under the administration of this drug the auricular flutter was replaced by fibrillation.

Of the four cases referred to by Hay (*Liverpool Medico-Chir. Journ.*, 1913, p. 88) two passed from flutter to fibrillation, and in one the latter gave way to a normal sequence of auricle and ventricle. According to Hay, auricular flutter may be suspected when sudden attacks of accelerated ventricular action occur, with a frequency of 140, 150, or more beats per minute, during which the reserve power of the heart is diminished ; the rapid action of the heart being unaffected to any appreciable degree by posture, emotion, or exertion. Flutter may also be suspected if the rate of the pulse becomes halved or diminished by one-third when digitalis is given in full doses ; or if the pulse becomes not only less frequent but also manifests a peculiar and otherwise inexplicable irregularity ; or if a marked bradycardia results under digitalis administration, such as a rate of 30 or 40 beats per minute, with or without coupling of the beats ; and if when such an arrhythmia or bradycardia is present, exercise causes the temporary resumption of a more regular and frequent heart action. Hay draws the justifiable conclusion that it is to the auricles we must look for an explanation of some of the most serious and common forms of heart failure.

In contrast with tachycardias of auricular origin, those of an essentially ventricular nature are comparatively rare. Stuart Hart (*Heart*, 1912, iv. 128) states that of seventeen cases of paroxysmal tachycardia he has analysed there was only one in which there seemed to be adequate proof that damage to the ventricular musculature was the underlying cause of the paroxysms. The patient was a man aged 49, who complained of palpitation, insomnia, and attacks of giddiness, and who had suffered from syphilis. During the paroxysms, which were studied by means of the electro-cardiograph, the rhythmic ventricular beats at a rate of approximately 200 per minute originated in the ventricular musculature.

THE RELATION OF SYPHILIS TO CHRONIC NEPHRITIS.

Since the introduction of the Wassermann reaction, the close relation of chronic nephritis and cirrhosis of the liver to syphilis has been engaging the attention of clinicians. Letulle and Bergeron (*Presse méd.*, 1912, p. 777) have tested 46 cases of chronic nephritis and found 34 gave a negative and 12 a positive reaction. Only three of these twelve patients admitted a history of syphilis, and none of the twelve presented definite clinical signs of that disease. In some of the cases mercurial treatment was employed, but it did not tend to lessen the albuminuria. In some of the cases other possible etiological factors,

such as lead poisoning and scarlet fever, were recorded, but the writers consider that even in such cases the luetic infection had contributed to the unfavourable progress of the nephritis. In eighteen cases of hepatic cirrhosis the Wassermann reaction was positive in seven. In five of these seven cases there were other evidences—leucoplakia, chronic orchitis, perforation of the palate, etc.—which strongly suggested a history of syphilis.

Prognosis of Albuminuria with or without Casts.

The prognostic significance of albumin and casts in the urine of men who were otherwise apparently healthy has been investigated by Barringer and Warren (*Arch. of Intern. Med.*, 1912, ix. 657). They analysed the records of 396 cases and classified them in three groups : (1) 115 cases with albuminuria, but without tube casts : (2) 203 cases with albuminuria and hyaline tube casts : and (3) 53 cases with albuminuria and granular casts. The men showing albuminuria alone were five times more frequent before the twentieth year than in later life. Ten years later, 70 of the original 396 men were examined again. Twenty of the men had belonged to the first group. None of them now has interstitial nephritis so far as can be determined by the condition of the heart, blood pressure, and urine. Four present albuminuria, however, and four have both albuminuria and tube casts. Of thirty men who had been included in the second group, eighteen are now normal as regards heart and kidneys, nine show the same condition of the urine as they did ten years previously, while five have a slightly raised blood pressure. Of twenty men who had presented albuminuria and granular tube casts ten years previously two now have interstitial nephritis : in five the diagnosis is doubtful : eight are normal as regards heart and kidneys. The writers conclude that it is exceptional for renal albuminuria without tube casts in young adults to be a sign of incipient nephritis. This form of albuminuria should rather be regarded as evidence of a generally lowered resistance which predisposes to tuberculous infection : and the mortality among these persons is higher than among normal subjects. Whatever the urinary findings, age is a factor in the prognosis of albuminuria, young people having the most favourable outlook as regards the possibility of an ultimate nephritis.

Syphilis of the Lung.

Although by no means frequent, syphilis of the lung is not so uncommon as is often supposed. The whole subject is fully discussed by Massia (*Gaz. des hôpit.*, tome lxxxiv. pp. 1829-1871). The tertiary lesions have been classified under the headings of syphilitic pneumonias (gelatinous infiltration, white pneumonia, and caseous pneumonia), gummata, and syphilitic pulmonary scleroses, the latter being the terminal stages

of antecedent lesions. Massia follows the classification adopted by Fournier, Dieulafoy, and other writers. (1) *Latent Syphilitic Pneumonia.* —This form is usually unrecognised until post-mortem examination reveals one or more gummata in the lung. The patients do not complain of pulmonary symptoms, and a clinical diagnosis is seldom possible except by means of Röntgen-ray examination. (2) *Acute Form* (*Caseous Syphilitic Broncho-pneumonia*).—The case resembles one of tuberculous broncho-pneumonia, with sudden onset, cough, muco-purulent sputum, which may be hæmorrhagic, dyspnœa, and a febrile temperature which is in no respect characteristic. The disease lasts for several weeks, and usually terminates fatally. (3) *Chronic Form* (*Syphilitic Phthisis*).—The onset is invariably insidious, but there is less cough, hæmoptysis, and anæmia than in pulmonary tuberculosis. The initial symptoms are those of a mild bronchitic attack, with little or no expectoration, slight dyspnœa, and a normal temperature, while the appetite remains good : and many months may elapse before the patient seeks advice. The clinical features are then those of a chronic bronchitis with some muco-purulent sputum which may be found to contain fragments of necrotic lung tissue infiltrated with leucocytes. Hæmoptysis, except in slight degree, is unusual. Dyspnœa, however, usually becomes marked, and it is often wholly disproportionate to the extent of the physical signs in the chest. Meanwhile, the patient's general health remains good on the whole, and his weight is maintained, so that the man with chronic pulmonary syphilis is, as Bazin has said, "un caverneux bien portant." An important diagnostic sign is the normal course of the temperature. The physical signs are manifold. There may be areas of dulness, with harsh or enfeebled breath sounds, and rhonchi, or the signs may indicate the existence of bronchiectatic cavities. These signs are not necessarily localised, or even predominant, at the bases. At a later stage of the disease the patient becomes emaciated and cachectic, with hectic fever, nocturnal sweating, and profuse expectoration, and ultimately there may be a fatal issue. The course of the disease may be complicated by the onset of gangrene of the lung, pleuritic effusion, laryngeal syphilis, or pulmonary tuberculosis.

Pulmonary syphilis is usually a chronic disease with acute exacer-bations from time to time which are doubtless due to intercurrent bacterial infections of the respiratory tract. In the diagnosis from pulmonary tuberculosis too much stress should not be laid on the limitation of the physical signs to the bases of the lungs. A history of syphilis, any other signs of this disease, or a positive Wassermann reaction, would be of importance. General constitutional disturbance is less marked than in tuberculosis, and tubercle bacilli are not detected even after repeated examination. If in addition there be a satisfactory response to antisyphilitic treatment, the diagnosis is beyond doubt. The differential diagnosis from encysted pleurisy, cancer of the lung,

mediastinal tumour and syphilitic mediastinitis, is seldom a matter of difficulty.

In treatment the best results are obtained from mercury given in combination with the iodides. Massia recommends that these drugs should be given to every case of pulmonary tuberculosis which has a history of syphilis, and to all cases in whom the precise nature of the pulmonary affection may be in doubt.

SYPHILIS OF THE STOMACH.

The experience of Myer (*Interstate Med. Journ.*, 1912, xix. 974) does not conform with that of Lang and others, who place the percentage of syphilitic ulcers of the stomach as high as 10 or 20 per cent. of all gastric ulcers. Myer has only seen two cases of gastric ulcer that responded to antisyphilitic treatment so promptly as to justify a diagnosis of syphilitic ulcer. Syphilitic tumours of the stomach are likewise extremely rare, Sacconaghi stating that there are only eight cases of circumscribed palpable syphilitic tumours of the stomach reported in modern literature. Myer now records two well-marked cases of this nature, and he concludes that careful inquiry as to the possibility of syphilis should be made in every case of chronic gastric ulcer and tumour of the stomach, in order that antisyphilitic treatment may be instituted. If the growth is obstructing the pylorus, however, a gastro-enterostomy should be done, even although a positive history and a positive Wassermann reaction have been obtained, and antiluetic treatment should be instituted afterwards. W. T. R.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

GASTROCOLOPTOSIS.

UNDER the above title Rovsing of Copenhagen (*Ann. of Surg.*, January 1913) describes at some length his views on the etiology, symptoms, and treatment of enteroptosis, more especially as it concerns the stomach and colon. Rovsing puts aside Glenard's view that the condition is due to a nutritive disease which causes atrophy and prolapse of the small intestine with consequent loss of support for the stomach, colon, and liver, and he also rejects Stiller's hypothesis that general weakness and debility with relaxation of the tissues are responsible for the dropping of the viscera and the associated symptoms. He has found enteroptosis almost exclusively in women, and believes that its production is very simply explained, first by the misuse of corsets and lacings; and second, by the changes which pregnancy and childbirth involve in the intra-abdominal pressure.

From a study of the 400 cases which he has treated, Rovsing maintains that all the morbid symptoms and conditions which we find typical in patients with enteroptosis are naturally explained by and are secondary to the ptosis itself. He distinguishes two varieties of the disease, virginal and maternal gastrocoloptosis.

The *virginal* form begins a year or two after puberty, and is marked by persistent constipation, weariness, headache, distaste for food, gastric pain induced by the quantity, not the quality, of the food, *i.e.*, small meals may be tolerated, but large ones cause pain by the drag on the stomach. Vomiting may be present, and in addition a variety of nervous symptoms may supervene, due to the auto-intoxication going on, and commonly put down to hysteria and neurasthenia Rovsing believes that the essential cause of these symptoms is the narrowing of the lower thorax by corset pressure which pushes down the subdiaphragmatic organs. The peritoneal attachments of the organs are stretched, abnormal bendings and foldings of the hollow viscera are caused, resulting in intestinal and gastric stasis. The disease is frequently confused with gastric ulcer, colitis, or nervous or hysterical disease of the stomach. Complications are said to arise in the form of dysphagia, due to dragging on the œsophagus by the stomach, and in the development of hour-glass stomach by that organ being folded on itself with subsequent adhesion between the opposed peritoneal surfaces. This form of hour-glass stomach has been seen in all stages of development by Rovsing.

Maternal gastrocoloptosis is found in women after pregnancy in whom the abdominal wall is relaxed. The pains and nervous symptoms are said to be less marked than in girls, the dominating feature being constipation. Treatment must be either by belt to support the viscera, or by operation The symptoms of virginal ptosis do not readily yield to belt treatment, but maternal ptosis may be much benefited by an appliance which exercises firm pressure over a wide area in the hypogastrium, and which can be easily applied while the patient is recumbent. When this treatment fails, operative treatment to raise the stomach and colon must be employed. Rovsing's operation consists in leading three strong silk threads in and out through the serous coat of the anterior aspect of the stomach from left to right, 2 centimètres from each other and rather nearer the lesser than the greater curvature, leaving out the pyloric portion. The stomach wall between the threads is scarified with a needle, as also the parietal peritoneum and under aspect of the liver to which the stomach should be made to adhere. The ends of the stomach threads are then led through the abdominal wall so that when tied, after the operation wound is closed, the stomach will be held, without folding, against the abdominal wall. The wound is closed and the stomach sutures tied over a large pad. In four weeks' time they are removed. When the gastro-colic ligament is unduly long it should be shortened by thick catgut stitches inserted

from stomach to colon. In some cases nephropexy may be required as an additional measure. Rovsing has done 163 gastropexies and has information about 93 cases treated by other surgeons, a total of 256 cases. 162 of these have been cured, 33 greatly improved, 18 improved, 32 slightly improved or unchanged, and 8 have died.

POST-OPERATIVE THROMBOSIS AND EMBOLISM.

Wilson, who acts as pathologist to the Mayo clinic in Rochester, has made a study (*Ann. of Surg.*, December 1912) of the fatal cases of post-operative embolism which have occurred in St. Mary's Hospital. For the first 10 years after the founding of the hospital no case of this complication arose among the 6000 cases operated on, but during the next $12\frac{1}{4}$ years 47 fatal cases and a number of non-fatal cases occurred among the 57,000 operation cases, and 41 of these were examined post-mortem. The youngest patient was 25 years old, the oldest 72, the remainder being evenly distributed throughout the intervening decades. The majority of the patients had been subject to some chronic debilitating disease for from 2 to 35 years, were seriously ill when operated on, and were, according to Wilson, probably the subjects of "low-grade bacteræmias."

Forty of the cases occurred within a fortnight of operation, and it was noted that in these the patients were said to be progressing very well, in contrast to their debilitated condition before operation. The embolism was pulmonary in 36 cases, cerebral in 10, coronary in 1. In 28 out of 41 cases it originated in the field of operation or femoral vein, in 4 cases in the heart, and in 9 cases the site of origin could not be exactly determined. In 5 cases no pathological condition except that incidental to the operation was present, but the remaining cases showed various morbid conditions such as arteriosclerosis, chronic myocarditis, chronic nephritis, and chronic hepatitis. An analysis of the figures from the Mayo clinic along with a study of the literature of the subject led Wilson to suggest the following considerations regarding post-operative embolism. Following operations, particularly on the blood-vessels, alimentary canal, and genito-urinary organs, both male and female, from 1-2 per cent. of cases give distinct clinical evidence of emboli, above 70 per cent. of which are in the lungs. As nearly as can be observed from the data available, about 10 per cent. of clinically evident post-operative emboli cause sudden death. Post-mortem examination shows the source of the emboli to be venous thrombosis in 80 per cent., cardiac in 10 per cent., while the source of the remainder cannot be accurately determined.

In considering the various factors at work in the production of thrombosis and embolism, Wilson lays special stress on the view that bacteria and their toxins are the chief causes of post-operative thrombosis. Burham (*Ann. of Surg.*, February 1913) has analysed the results

of 11,655 operations to determine the incidence of thrombosis, without special reference to fatal embolism, and as regards etiology he is in agreement with Wilson in so far as he says that after examining a large number of records it is impossible not to feel that the process is the result of one of the milder self-limited types of non-pyogenic infection, and he makes the interesting suggestion that the absorption of material from the wound, in the form of broken-down cellular elements and serous exudate, with or without bacteria, causes such changes in the blood as to lead to phlebitis and thrombosis.   In support of this he points out that thrombosis always occurs after some absorption has taken place, and usually while it is most active.   Where drainage has been used it comes on later than in clean cases.

As regards prevention, neither writer has anything of note to suggest, and it is noteworthy that they do not support the view that getting patients out of bed at an early date after operation is of any value in preventing thrombosis.

Approach to the Hypophysis Cerebri through the Anterior Cranial Fossa.

Frazier (*Ann. of Surg.*, February 1913) describes a new method of approach to the pituitary body.   He emphasises the great importance of the X-ray findings in determining the choice of the route for approaching the hypophysis.   When the picture shows that the sella turcica has been deepened and is encroaching on the sphenoidal cells without its orifice being enlarged, *i.e.*, when the pituitary enlargement has been downward, access should be by one of the trans-sphenoidal methods. When, however, the sella turcica has an enlarged orifice showing that the pituitary has apparently enlarged upwards and encroached on the brain, an intra-cranial route should be chosen.   Frazier's method is designed for the upward enlargement of the pituitary, and consists in turning outward an osteoplastic flap in the right frontal region, the lower limit being at the upper orbital margin, the upper limit just within the hair line.   After reflecting the flap, the supra-orbital ridge and part of the orbital root are removed *en bloc*, to be replaced later, and the remainder of the orbital roof is chipped away, back to the optic foramen.   The frontal lobe is elevated and the orbital contents depressed, giving a free exposure of the dura, which is then incised to lay bare the contents of the sella turcica.   Frazier reports two cases in which this procedure was successfully adopted.   Three figures in the paper illustrate clearly the plan of the operation.

Fracture of the Odontoid Process of the Axis with Intermittent Pressure Paralysis.

Elliot and Sachs (*Ann. of Surg.*, December 1912) report an interesting case of a man who fractured his odontoid when 18 years old, recovered,

and lived an active life for 32 years afterwards, eventually dying of pressure paralysis. His injury was caused by a fall on to the back of his head. This was followed by paralysis, confining him to bed for six months and causing stiffness in the movements of his head for a year. He made an apparently perfect recovery, and remained well for five years. He was then, shortly after a fall on the shoulder, suddenly seized with paresis in both arms and one leg. Under treatment in hospital this passed off. Four years later he had a similar attack, which also passed off. Seven years later a fall on the ice caused a fourth and fatal attack of paralysis. Death did not take place till many months after the accident, and was caused by the respiratory embarrassment associated with the gradual spread of the paralysis. On post-mortem examination it was found that an old fracture through the base of the odontoid process was present, and that the atlas had slipped forward, taking the broken odontoid with it. The space for the cord was consequently narrowed, and the cord was nipped between the posterior arch of the atlas behind and the base of the body of the axis in front. A false joint was present between the atlas and fractured odontoid above and the axis below. The atlas and fractured odontoid were united to each other by bone.

The condition was accurately diagnosed during the last attack of paralysis, but the patient's condition was too grave to allow of an operation being done for his relief. The case shows definitely not only that such an accident need not be immediately fatal, but that practically complete recovery may take place.   J. W. S.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

THE APPENDIX VERMIFORMIS IN OBSTETRICS AND GYNECOLOGY.

DEFECTS in our knowledge of the inter-relations existing between the appendix vermiformis and the female generative organs are gradually being remedied, and a large mass of facts, pathological, symptomatological, etiological, and therapeutic, is being gathered together. Some of the contributions to this field of investigation have been short, although in many cases important, and others have been long and also important. To the latter group belongs Dr. G. L. Basso's monograph of a hundred and two pages (*Annali di ostetricia e ginecologia*, ann. XXXIV., vol ii., December 1912, pp. 615-717). In an article of so great length it is almost a *sine qua non* that the various subjects or aspects of subjects dealt with should be indicated either by italics or by sub-headings ; this is lacking in Dr. Basso's contribution, and, to a foreigner at any rate, it makes the many interesting conclusions reached and

facts given much less accessible. For instance, the naked eye anatomy of the appendix vermiformis, its histology, physiology and pathology, all follow one another with no typographical device to separate them. This is doubly a pity, for the matter is very good.

It is very good, and it becomes a problem of some difficulty to select from it what is of most interest. In relation to their gynecological aspects diseases of the appendix have an importance which has no doubt been underestimated, and is still by some operators insufficiently recognised. If one has regard to the frequency with which the appendix has a pelvic position—and some give it as high as 40 per cent. and others as not less than 13 per cent.—there can be no reason for surprise that this part of the intestine comes into intimate relation with the tube and ovary of the right side, and also with the uterus in some cases. Inflammation of the ovary and tube, and inflammation about these organs (periannexitis, as it has been called), may both originate in an appendicitis : and so may a parametritis. On the other hand, appendicitis or peri-appendicitis may arise secondarily from inflammatory disorders of the uterine annexa or pelvic peritoneum. In rare cases it may suffer along with other pelvic structures in the inflammation set up by torsion of the pedicle of an ovarian cyst or in the course of an ectopic pregnancy. Again, appendicitis and inflammatory affections of tubes, ovaries, uterus, parametrium, etc., may coexist and be of independent origin. Yet again, appendicitis may occur as a sequel to an operation on the pelvic organs. There are still other ways in which the appendix vermiformis and gynecological states are brought into close touch. The grand conclusion of the whole matter is that the gynecologist must have this part of the digestive tract in his mind when he makes his diagnosis, and be capable of dealing with it surgically in the course of his operative work. Indeed, the conclusion is even wider : the gynecologist must be prepared to act as an abdominal as well as a pelvic surgeon as occasion demands : he must be prepared to operate on organs outside the genital sphere when he has opened the abdomen for a tubal condition and finds a diseased appendix, or when he tears the bowel in the course of an oophorectomy or salpingectomy. And there is another side to the responsibility : the abdominal surgeon must be ready to deal with morbid states of the organs peculiar to the female discovered in the course of his work. There is no anatomical boundary between the abdominal and the pelvic cavities.

The appendix is also related to obstetrical problems and occurrences. It is not yet possible to say how often appendicitis occurs as a complication of pregnancy. It is probably not common, for there is no reason to suspect pregnancy of initiating an appendicitis, but it is not to be forgotten that it may favour a return of the malady or even (in labour, at any rate) predispose to perforation of the diseased appendix. If looked for, appendicitis in pregnancy may be

found to be commoner than is generally supposed. At any rate the obstretrician of the present can no longer afford to ignore appendicitis, and he must keep its occurrence as a possibility in his mental outlook, not only in pregnancy but also (and perhaps more distinctly) in labour and the early days of the puerperium. Dr. Basso thinks, however, that the risk of appendicitis producing miscarriage and premature labour has been exaggerated; at any rate one must distinguish clearly between uncomplicated cases of appendicitis and those which are accompanied by abscess formation and peritonitis, the latter being, of course, much more likely to be disastrous to the pregnancy.

In the same journal in which Dr. Basso's long contribution appears there are also two short ones on the same subject (*Ann. di ostet. e giner.*, ann. xxxiv., 1912, vol. ii. pp. 746, 747). Conte of Naples tells of a patient who was delivered by Cæsarean section and suffered in no way from digestive troubles, yet three years later, when the abdomen was opened again, the tip of the appendix was found to be adherent to the Cæsarean cicatrix. A "Porro" section was therefore performed and the appendix was removed. It is noteworthy that the fixation of the appendix in this instance gave rise to no trouble, but Conte recalls the case reported by Schon in which a similar state of affairs (after Cæsarean section) led to appendicitis requiring operation. Doubtless in doing a Cæsarean section the operator should examine the appendix and remove it if diseased; possibly he would be wise to do appendicectomy as a prophylactic measure in every case. In cases of cæcal ptosis the operation of cæcopexy should also be considered.

The other short paper is by Montuoro of Palermo, who during an abdominal section discovered tubercular peritonitis, retroflexion of the uterus, and appendiculo-annexial adhesions. The last-named lesion was the cause of severe attacks of suffering, especially marked at the monthly periods. Appendicectomy was performed and the uterus was fixed in its proper place by Pestalozza's pelvic hysteropexy.

In illustration of the manner in which an annexial lesion may simulate an attack of appendicitis reference may be made to Dr. F. C. Hammond's communication made to the Obstetrical Society of Philadelphia (*Amer. Journ. Obstet.*, 1913, vol. lxvii. p. 151). The patient was a married woman, thirty-four years of age, who was suddenly taken ill with severe pain in the lower right quadrant of the abdomen; this was followed by nausea and vomiting, and McBurney's point was indicated by the patient as the seat of the suffering. Dr. Hammond, who saw the case in consultation, was asked to operate for suspected acute appendicitis. There was very evident tenderness on pressure, most marked at McBurney's point, and the muscles of this part of the

abdominal wall were rigid. When, however, the routine bi-manual examination was made a rounded fluctuating mass was felt on the right side of the pelvis. This was regarded as an ovarian cyst, and it was found to be so when the abdomen was opened. Its pedicle was twisted four and a half times, and the cyst was beginning to have a bluish colour. The torsion was undone and the cyst removed, but the appendix, which was not involved, was left alone. The discussion which followed the reading of Dr. Hammond's paper emphasised the importance of examination of the pelvis before opening the abdomen for appendicitis in female patients. Dr. Stephen E. Tracy (*loc. cit.*, p. 152) thought that the general surgeon was more likely to make mistakes, for he was inclined to regard nearly all lesions in the right lower quadrant of the abdomen as appendicitis cases. He referred to cases in which the surgeon, after removing an innocent appendix, pulled up a large pus tube which had evidently been the guilty organ. He had seen a case of uterine fibroid attached by a pedicle to the cervix, yet that woman had had her abdomen opened for appendicitis. He had also seen cases of appendicitis associated with pregnancy, one with ruptured tubal gestation, and one with a left-sided ovarian cyst with twisted pedicle. Dr. Colin Foulkrod gave his experience of appendicitis in relation to obstetric and gynecological states. He had operated on a patient who had had appendicitis with pain so severe that extrauterine pregnancy was thought of : when the abdomen was opened a diseased appendix and a dermoid cyst of the right ovary were found. Another case regarded as pregnancy associated with localised peritonitis, turned out to be pregnancy in a uterus with a fibroid tumour, the latter being incarcerated in the pelvis. Dr. George M. Boyd (*loc. cit.*, p. 153) had met with a case diagnosed as appendicitis, but before operating he had examined vaginally and found a mass lying to the back and left side of the uterus : he therefore opened the abdomen in the middle line and removed the swelling behind the uterus, which was a pus tube, and also an inflamed appendix. If he had not examined the pelvis he might very easily have made a lateral incision, have removed the diseased appendix, and missed the pus tube altogether.

The experiences recorded took place in Italy and America : but similar observations have been made elsewhere. In France, for instance, Dr. Paul Delbet, in a communication to the Society of Surgeons of Paris (*Arch. mens. d'obst. et de gynéc.*, ann. i., November 1912, p. 430), gave details of a patient in whom he had found, on opening the abdomen for suspected extra-uterine pregnancy, quite another state of affairs : there was right-sided salpingitis, gangrenous appendicitis, and an intra-uterine gestation. The woman had complained of retarded menstruation, pain in the right flank, vomiting, and some loss of blood per vaginam : but she had no fever. At an earlier meeting of the

same society Dr. Cazin had related an experience in which a diagnosis between septic appendicitis and ruptured tubal pregnancy could not be made with certainty. He opened the abdomen and found an ovarian cyst with its pedicle twisted twice and ruptured near the pedicle, and the uterus contained an early pregnancy which terminated in abortion the day after the operation. At yet another meeting of the Society of Surgeons of Paris (*loc. cit.*, p. 431) Dr. Cazin gave another experience and emphasised another aspect of this interesting subject. He had been doing a hysterectomy for a uterine fibroid and had removed the appendix also, not because he thought it was diseased, but simply as a routine practice; it was found to be the seat of chronic appendicitis.

Finally, to conclude this catena of recent experiences illustrating the relation of appendiceal troubles to maladies of the female generative organs, reference may be made to Dr. George Tully Vaughan's case of ectopic pregnancy complicating appendicitis (*Amer. Journ. Obstet.*, vol. lxvi. p. 829, 1912). The patient, a coloured girl of only fifteen years, had complained for some two or three years of pain in the region of the appendix, sometimes accompanied by vomiting. Dr. Vaughan saw her in Georgetown University Hospital, and found her suffering from severe pain in the same region. She had menstruated three weeks previously: the right side of the abdomen was tense; and the pulse was 80 and the temperature 99°. The diagnosis of catarrhal appendicitis was made and the abdomen opened. A diseased appendix was removed and an ectopic pregnancy, both in the right side: the latter burst on handling. Chorionic villi were found in it, but no embryo.

All these instances, and others might be added from medical literature, serve to underline Dr. Basso's conclusion with which this summary commenced, viz., that maladies of the appendix and of the uterine annexa were often associated, that they had an influence on each other, and that as their differential diagnosis was very difficult, every surgeon opening the abdomen ought to be able to deal equally effectively with either, and every gynecologist should be able to treat with the same certainty morbid conditions of the ovaries and tubes and those of the intestine. As time goes on ways will doubtless be devised for a more perfect separation of the two groups of disorders In the meantime the opening of the abdomen will continue to be the only means of making sure whether it is appendix or tubes and ovaries which is at fault.   J. W. B.

LARYNGOLOGY, OTOLOGY, AND RHINOLOGY.

UNDER THE CHARGE OF

A. LOGAN TURNER, F.R.C.S., J. S. FRASER, F.R.C.S., AND
W. G. PORTER, F.R.C.S.

PFANNENSTILL'S METHOD OF TREATING TUBERCULOUS DISEASES OF THE UPPER AIR PASSAGES.

PFANNENSTILL had for many years had the idea that micro-organisms, and more especially tubercle bacilli, might be destroyed in the body if it were possible to introduce an antiseptic into the tissues in the nascent form. He first solved this problem by giving iodide of sodium internally and ozone to be inhaled. When these substances come in contact iodine is set free, and its action is greatly increased owing to its being in the nascent form. The first case treated by Pfannenstill was one of lupus of the pharynx and larynx; it was cured after a month's treatment. His second case was one of lupus of the nose, and it was also cured. The third case was a fairly severe case of laryngeal tuberculosis; the left vocal cord was almost destroyed by ulceration, and the false cord was infiltrated; cure resulted in this case also. Pfannenstill's work attracted considerable attention. Stangenberg (quoted from *Centralbl. f. Ohrenheilk.*, Bd. x. No. 5) treated a number of cases by this method, but a cure resulted in only one of these, and in it considerable surgical interference had been carried out. Tideström, in the discussion on Stangenberg's paper, stated that he had obtained good results by this method. He treated in all 13 cases; 8 of these were cured, 2 markedly improved, 2 improved, and only one remained as before. His cases had all been diagnosed clinically as tuberculosis of the larynx, but in only one did histological examination confirm the diagnosis. Strandberg employed this method of treatment in cases of lupus of the nose, but instead of giving ozone he used a solution of peroxide of hydrogen. Strandberg has now treated 104 cases of lupus of the nose (*Verhand.* 111, *Internat. Laryngo-Rhinologenkongress*, Berlin); 14 of these he had published before, and 8 of these were cured. Out of 78 cases treated till 1st July 1911, 38 were cured; in the remainder treatment was still being carried out or had been stopped for various reasons. The duration of treatment is usually 2-3 months. The method of treatment is now the following: The patient is given 1 grm. daily of iodide of sodium, divided into six doses; this is quickly raised to 6 grms. When the daily dose has reached 3 grms. gauze plugs are placed twice daily into the nose, and are moistened with the following mixture :—

Oxydol, 3	3 parts.
Ferri perchloridi, 5 parts	
Acid hydrochlor., 25 , 2 parts	} 2 parts.
Aq. dest., 500 parts	

The patient is given a bottle of this, and is also provided with a pipette with which he drops the fluid on to the gauze packing every ten minutes, the head being thrown back and sufficient being applied to allow of its being felt in the naso-pharynx. After a few days the nasal mucosa should appear markedly red and the ulceration more extensive than before; if this does not occur, either too little iodide of soda or too little peroxide of hydrogen has been employed. When there is a marked reaction a weaker solution is employed: Oxydol, 3 parts; acid acet., 1 part; aq. dest., 96 parts.

Stenosis of the Bronchi as a Result of Enlargement of the Left Auricle.

The space below the bifurcation of the trachea is filled by the left auricle, and the course of the left bronchus is accordingly influenced by the auricle, especially that part of it from where it is encircled by the aorta to the point where the main bronchus to the upper lobe is given off. Hence the course of the bronchus, which at first descends sharply, may become more horizontal if pressed upon by an enlarged auricle. These changes have been studied by Stoerk (*Zeitschr. f. klin. Med.*, Bd. 69) both in hardened preparations and by means of casts of the bronchial tree. Stoerk was enabled to recognise the following changes in every case of well-marked enlargement of the left auricle :— First, there is a widening of the inter-bronchial angle, and the triangular space which is found normally between that angle and the upper border of the auricle becomes entirely filled up by the auricle; hence the angle of departure of the bronchi becomes altered so that the main bronchi lie more horizontally, and in extreme cases may even form an angle of 90 with the trachea. When the main bronchus on the left side is relatively long, and when the angle of bifurcation is unusually fixed, an angular bend may frequently be detected in the bronchus—the first part descending somewhat steeply, while the further portion is pressed upwards. This also causes a flattening of the left bronchus, especially the lower and anterior part of its walls. These changes are all more marked when the enlargement of the auricle is associated with an increase in size of the right ventricle. O. Kahler (*Monatschr. f. Ohrenheilk.*, Bd. xlvi., Heft 5), stimulated by Stoerk's work, undertook bronchoscopic examinations in cases of cardiac disease in order, if possible, to confirm clinically the observations of Stoerk. His examinations were restricted to patients who proved tolerant of the procedure; morphia was given hypodermically before the examination, and the larynx was anaesthetised with a minimal quantity of 20 solution of cocaine. Kahler examined 13 cases in all—11 of mitral stenosis, 1 of mitral incompetence, and 1 case of aortic incompetence. The first point of importance to note is the position of the carina, or spur, at the bifurcation of the trachea. As is well known, the carina is situated, in

the majority of cases, to the left of the middle line, so that the right bronchus forms a direct prolongation of the trachea. In 100 cases in which Kahler noted the position of the carina it was to the left in 72 and only three times to the right of the middle line, while in the 13 cases above mentioned it was mesial in 10 cases—once to the left and twice to the right of the middle line. This would suggest that the change in position depended on the enlargement of the auricle.

As regards the course of the bronchi it is difficult to draw any definite conclusions, as the physiological variations are considerable; but in six cases the direction of the left bronchus closely approached a right angle, and in three patients a definite bend could be made out in the left bronchus such as is described by Stoerk. A typical change was made out in every case with one exception (the ease of pure mitral incompetence), namely, narrowing of the lumen of the left bronchus; this varied from a slight flattening of the wall to a well-marked narrowing of the lumen. The degree of narrowing seems to depend on the amount of enlargement of the auricle. The pulsatory phenomena are also not without interest; as is well known, pulsations can be observed in health. The pulsations of the carina vary; they may take place either from right to left or from left to right, and occasionally dorso-ventral pulsations are observed. In Kahler's cases the pulsations of the carina were almost invariably from left to right. The pulsations in the left bronchus were also noteworthy, and consisted in a rising of the flattened portion of the wall of the bronchus. In three cases a left-sided recurrent paralysis was present. These patients sought advice on account of hoarseness, and were unaware that they were suffering from any cardiac trouble. They were subjected to a bronchoscopic examination, as is the routine in the clinic, in order to determine the cause of the paralysis, and the appearances were so characteristic of those found in cases of mitral disease that the patients were referred to the physician, with the result that a diagnosis of a mitral lesion was confirmed

W. G. P.

THE EFFECT UPON THE VOICE OF REMOVAL OF THE FAUCIAL TONSILS.

There is a popular and widespread belief, both within and without the profession, that the removal of the faucial tonsils is in some way prejudicial to the voice. The experience of laryngologists on this point would seem to vary. In the first place, it may be well to state that there is no absolute standard of vocal excellence, and the voice that sounds good to one person may sound very different to another. In other words, as to whether a voice is good or bad depends, not actually but practically, upon the ear of the listener. This fact may to some

extent account for the great diversity of opinion now prevailing as to the effect of tonsil operations upon the voice.

The question has been discussed by Hudson M'Cuen (*Trans. Amer. Lar. Assoc.*, 1911). Three points require consideration :—(1) Has the normal tonsil any function in voice production? (2) Is the abnormal tonsil prejudicial to voice production? (3) Does the removal of abnormal tonsils necessarily injure the voice? In studying this subject the soft palate requires careful consideration, because it is one of the most important of the phonatory organs, and upon its normal action the normal action of the other phonatory organs must depend, namely, the tongue and larynx. One of the important functions of the soft palate in phonation is its valvular action, whereby vocal resonance is markedly affected. This valvular action may be greatly interfered with by abnormally large tonsils, so that the soft palate fails to close, leaving the oro-pharynx in free communication with the nasal cavities, and thus giving to the voice a certain recognised faulty resonance. When the tonsil is not enlarged, but when it is the subject of inflammation and often associated with congestion of the faucial pillars and pharyngitis, it is in itself a menace to the voice. Consequently in these two classes of case the question is not really one of injuring the voice by operation, but rather of improving it or actually saving it. In other words, the vocal instrument is here structurally defective, and it is obviously the duty of the surgeon to remove them. In what way may this best be done?

In this connection the capsule of the tonsil may be worthy of some consideration, and a pertinent question may be: Has it any function in phonation after the tonsil has become diseased? The writer is of the opinion that it has, or at least he has found that after its removal there often result conditions decidedly harmful to phonation, such as adhesions between the muscles and cicatricial contractions of the mucous membrane. It is true that these conditions may be avoided by making only clean dissections and avoiding injuries to the muscles, but however well this may be done, after the operation we rarely see the palatal arches and tonsillar fossæ presenting their normal outline. On the other hand, the capsule itself in old inflammatory cases may be adherent to the surrounding muscles, so that its presence may be extremely harmful to voice production, and a careful dissection for its removal may be necessary.

It is probably wiser to study each case by itself, and not to regard a single operation as suitable in every instance. The danger lies in using too much force upon delicate structures, and in many instances a lack of care has been followed by injuries to the soft palate which are beyond repair and which have proved disastrous to the voice.

The two important indications for the tonsil operation are the removal of septic foci and the restoration of the functional efficiency

of the phonatory and articulatory organs. To bring this about
requires a careful operation, and the popular belief that the voice
may be injured by operative measures has a basis of foundation due
to the fact that in such cases there has been either careless or bad
surgery. If injuries to the soft palate can be avoided in the complete
removal of the tonsil, such an operation should not prove prejudicial
to the voice.   A. L. T.

NEW BOOKS.

Manual of Human Embryology. Edited by Franz Keibel and
  Franklin P. Mall. Vol. II. Philadelphia and London:
  J. B. Lippincott Co. 1912. Price £2 net.

This handsome volume of over a thousand pages and 658 illustrations
completes the manual and provides the research worker and teacher
with one of the best books on this subject. Out of the matter treated—
the nervous system, sense organs, vascular system and its allied organs,
the urino-genital system, etc.—we may select the sections on the lym-
phatic and urino-genital systems to show the thoroughness and ability
of the writers.

The development of the lymphatic system is contributed by
Dr. Florence Sabin, and is the outcome of the suggestive papers
already published by her in the *American Journal of Anatomy.* The
chief point elaborated by her and Lewis is that the lymphatics do not
arise in the system of tissue space, but from the veins. She has also
shown that the skin lymphatics arise as isolated areas, coalescing after-
wards. The development is divided into a primary and secondary
stage. "The primary stage consists of a series of isolated lymph sacs
which are clearly derived from the veins, and which become united
into a system through two agencies—(*a*) by the thoracic duct, and
(*b*) by a secondary opening into the veins of the jugular vein. The
secondary stage involves the peripheral growth of lymphatic vessels which
sprout from the endothelial lining of these sacs and spread out over
the body. The invasion of the body is gradual, and in certain areas
never takes place, as, for example, in the central nervous system and the
skeletal muscles" (pp. 709, 710). The proof of this is mainly given from
human embryos, and is illustrated by many diagrams and reconstruction
models. The whole account is very clear.

The *pièce de résistance* of the volume is, however, supplied by
W. Felix of Zurich in the development of the urinogenital organs.
This runs to 250 pages, and, illustrated as it is by over a hundred
figures, gives an unsurpassed account of this fundamental system.
In the description of the development of the reproductive glands
and their ducts it is satisfactory to note the view the writer takes
of the origin of what he terms the genital cells, viz., those from
which the ova and spermatozoa arise. Thus he states: "Hitherto

it has been supposed that the genital cells were specially differentiated cœlom cells, derived from that portion of the cœlom wall that forms the reproductive glands. But the more our knowledge of the origin of the genital cells increases the more probable does it become that we must modify this original belief. It has now been shown for all classes of the vertebrates, with the exception of the mammalia (Rubaschkin, 1909), that the first (?) genital cells have a special origin, probably being derived directly from the segmentation cells. I therefore term these cells *primary genital cells*, in contradistinction to those that are differentiated from the epithelial covering of the reproductive glands. These may be termed secondary genital cells. . . . It is possible that with the aid of mitochondrial staining it will be shown that the secondary genital cells are derived from the primary ones, and then all grounds will be removed for contrasting them as special cells with the primary genital cells" (pp. 882, 883). This is satisfactory, and the consequences of such a view are of the most far-reaching nature. The author holds that the sexual gland is at first indifferent in its nature, and becomes ovary or testis afterwards. This is an unlikely view, but it would take up too much space to discuss it. Although widely held, it is, we believe, erroneous.

The author holds to the origin of the vagina from the Müllerian ducts, and considers the view of there being a Müllerian and urinogenital sinus portion as incorrect, or, as it is to our ears more strongly put in the German edition, "*sicher falsch*." On this he is too confident. He puts the origin of the hymen at Müller's tubercle, and thus the vestibule alone (apart from the lower end of the urethra) represents the long urinogenital sinus of the six-weeks' embryo. When he says that "direct embryological observation shows that the hymen arises from the tubercle" (p. 924) he omits well known facts which point to the hymen being an organ of the urinogenital sinus, and derived from the Wolffian ducts.

The whole volume is most satisfactory, and all concerned in its production are to be congratulated on their success.

Such a work is the result in the main of serial sectioning and model making. If in a future edition a section is added on the relation of evolution to embryological problems, especially as to the phylogenesis of the urinogenital system and its products, the student and researcher will be able to grasp more thoroughly the inter relations and origin of the various systems in a way that a mere ontogenetic consideration, good and necessary as it is, is not capable of doing.

Das Problem der Vererbung "erworbener Eigenschaften." Von Richard
    Semon. Leipzig: Engelmann. 1912. Mk. 3.20.
IN this work Semon, a well-known naturalist, discusses the inheritance of acquired peculiarities, one of the most disputed questions in evolution.

If a somatic variation is to be transmitted it must become causal in the germ plasma. Darwin saw this, and therefore his pangenesis theory. Weismann brought the discussion to a head by his views of the non-transmissibility of acquired peculiarities. Semon holds that under certain conditions a somatic variation has an influence on the germ plasma, and is thus inherited. This influence is expressed as an "engram," the difference between the determinant of Weismann and the engram of Semon being that the one is innate in the germ plasma, the other acquired.

The difficulty in Semon's view is that a variation is expressed as a result and has no formative power, and that no intermediate mechanism between the somatic variation and the germ plasma is known. One may call the process an "induction," but this is a metaphor, and one cannot investigate by metaphor. Semon's view has attained a certain amount of acceptance, and there are now evolutionists who strain at a determinant and swallow an engram.

In Darwin's time, great as it was, there was little embryology and none of the knowledge we now possess as to the phenomena at the bottom of mitosis, fertilisation and cross-fertilisation. It is by the interpretation of these that the solution of the disputed questions discussed in so interesting a manner by the author will be attained, not by an adherence to exploded methods which have done good service in their day, but are now retarding advance.

Manual of Medicine. By A. S. WOODWARK, M.D., M.R.C.P. Pp. 409. London: Henry Frowde, and Hodder & Stoughton. 1912. Price 10s. 6d.

THERE is no more difficult task to perform than to write a short Manual of Medicine, and we cannot say unreservedly that Dr Woodwark has succeeded particularly well with his enterprise.

The book is too small to be "a vade-mecum for the student," as the writer states in the preface, and a mere list of clinical features of a disease with no sufficient explanation of how they occur is very unsatisfactory. For instance, under acromegaly, bitemporal hemianopsia is mentioned, but with no reason given or suggested for its development. There is much room for greater exactness in the next edition. In referring to the treatment of myelogenous leukæmia X-rays are recommended to be applied for 15-20 minutes daily to the bones *for months*, but with no warning as to X-ray burns or the desirability of periods of rest from such treatment. In lymphatic leukæmia of the acute type the leucocytes are said to be greatly increased, and in chronic lymphatic leukæmia the increase is said to resemble that found in the acute. One requires to read the context with special care and no little previous knowledge to avoid error, and surely 100,000 leucocytes per c.mm. would constitute a somewhat

high leucocyte count in acute lymphatic leukaemia, while 300,000 would be very exceptional.

While these are a few of many statements which render the book, in our opinion, unreliable for the student, there is also much to be commended. Most excellent diagrams illustrate the medical anatomy of the nervous system, and very rough little sketches, which could surely be better drawn, give, nevertheless, a good bird's-eye view of the pathological anatomy of affections of the spinal cord.

The sections on the nervous system, fevers, and the chapter on immunity are among the best parts of the book.

The Theory of Schizophrenic Negativism. By Professor E. BLEULER. Translated by W. A. WHITE, M.D. Pp. 36. 1912.

THIS monograph is one of a series published by the American *Journal of Nervous and Mental Disease* either as original writings or in the form of translations of foreign papers which it is desired to introduce more widely to English readers. Several have reference especially to psychoanalysis and its claims in the investigation and treatment of mental disease. Freud and Jung have already contributed to the series, and the present is by an author already known for his work in this subject.

As the title indicates, the monograph is concerned with one of the prominent symptoms of dementia praecox, and is an endeavour to explain it mainly on psychological grounds. It is assumed that in the form of negativism more frequently met with in this disease there is a division of the personality as the basis of the symptoms. "All these patients have a life wound, which is split off from the ego as well as may be, and hidden by an opposite conception. For that reason they must defend themselves against any contact with their complex." In addition to this, however, there are certain other factors which the author considers to be predisposing causes. These he names ambitendency—the setting free of, with every tendency of a countertendency—and ambivalency, which gives to the same idea two contrary feeling tones and invests the same thought simultaneously with both a positive and a negative character. There is, besides, a lack of clearness and imperfect logic in schizophrenic thought which hinders or may render impossible a practical adaptation to reality by the affected person.

It will thus be seen that the explanation of negativism is almost entirely a psychological one. The condition is divided into external negativism, consisting of the negation of external influences, and internal, in which there is a contrary tendency opposed to the will. With regard to the former, Bleuler considers that several causes will be found to be at work. The most important in his opinion is the autistic withdrawal of the patient into his phantasies, which makes every influence acting from without comparatively an intolerable

interruption. As to the latter, he regards ambitendency, ambivalency, and schizophrenia as the chief factors. He states that he has arrived at these conclusions from careful study and examination of cases to which he was compelled by the unsatisfactory nature of present theories of negativism.

Many of his statements can be corroborated from experience, but whether his theories deduced from them are in all respects correct is a more doubtful matter. There is necessarily a good deal of conjecture about them, as insane persons, afflicted with negativistic symptoms, are usually unable to corroborate or deny hypotheses as to their mental processes. It is probable, too, that negativism is partly constitutional, like optimism and pessimism.

Enough has been said to show that from the psychological point of view this monograph is both interesting and stimulating.

Nutritional Physiology. By PERCY GOLDTHWAIT STILES, Assistant Professor of Physiology in Simmons' College, Boston. Pp. 271. Philadelphia and London: W. B. Saunders Co. 1912. Price 6s. net.

THIS is a book somewhat novel in subject, decidedly novel in the style of its exposition, and in both respects of unusual interest and merit. Its title is an exact and terse description of the theme, for it is a discussion of the problem of nutrition, prefaced by a résumé of the main principles of human and general physiology. This is not an easy subject to handle satisfactorily, but the author deliberately makes his task more difficult by renouncing to a large extent the aid of scientific and technical terms, and conveys his exposition in plain and popular language. The book is virtually, therefore, a translation of an intricate subject from the language of science into that of classical or general literature. And yet, by means of a well-grounded knowledge of the problems he is discussing, and by a very happy gift of analogy and illustration, the author seems to us to have achieved a striking success in his aim. To anyone possessed of elementary knowledge of biology and chemistry the introductory chapters on the structure and functions of the body, set forth as they are in admirably simple, clear, and graphic narrative, are not difficult to follow, and are a sufficient preparation for the closer study required for the problems of absorption, metabolism, and nutrition that are discussed in the later portions of the book.

The volume therefore is an exposition, apparently popular but really thoroughly scientific, of the allied subjects of digestion, metabolism, and nutrition. It can best be described as a very able critical review of the laborious classical researches on these subjects carried out in America by Atwater, Chittenden, Cannon, and many others.

A Text-Book of Pathology for Students of Medicine. By J. George
    Adami, M.A., M.D., F.R.S., and John M'Crae, M.D., M.R.C.P.
    Pp. 759. London: Macmillan & Co., Ltd. 1912. Price 25s.

The authors are careful to explain in the preface to this volume that it
is not merely an abbreviation of the already well-known works, *The
Principles of Pathology*, vol. i. by Adami, vol. ii. by Adami and Nicholls.
A glance through these works, however, will leave no doubt in the
mind of the reader that that is very much what the present volume is.
There are no long excerpts from *The Principles of Pathology*, it is true,
and many of the illustrations are new, but the arrangement and method
of dealing with the subject are identical. This does not, however,
detract from the merits of the work. Both these earlier books are, in
substance and method of presentation, in many respects excellent.
They are, moreover, often fresh and suggestive. On the whole, we
are inclined to think that the authors attempt too much in the present
volume. In trying to deal with every aspect of pathology they are
inclined to launch into theoretical disquisitions which are of little use
to the student, while, as a result, some important subjects receive scant
attention. Thus there are long paragraphs upon "cell differentiation"
and "pain," while the subject of "œdema" and the disease "pernicious
anæmia" are dealt with somewhat curtly. It is always a difficult
matter to decide what is essential, but in a book written especially
for students the fundamental pathological processes and the common
diseases must be accentuated.

We differ entirely from the authors upon the question of the classi-
fication of tumours. Upon the nature of these formations pathologists
are at present entirely in the dark. Why force upon the already over-
burdened student, then, an elaborate classification necessitating the use
of new terms which may at any time have to be given up on the
acquisition of fuller knowledge?

We are, however, very far from adversely criticising the work,
which has many most excellent points to recommend it to the student
of medicine. In many respects it is, as already stated, essentially
original, and, where not too abstruse and theoretical, it is (what a book
for students must be) interesting and easy to read.

We note one mistake in the letterpress. On p. 105, under figure
209, the reference should be to figure 191, not 189.

The Medical Diseases of Children. By T. R. C. Whipham, M.A., M.D.,
    M.R.C.P., Physician to the Evelina Hospital for Sick Children.
    Pp. 417. London: Henry Frowde, and Hodder & Stoughton.
    Price 10s. 6d. net.

This text book of the medical diseases of children is constructed on the
usual plan. It begins with a short sketch of the normal development
of the child, deals with infant feeding, and then devotes several chapters

to the special diseases of childhood, rickets and scurvy, the common infectious fevers, and the various manifestations of tuberculosis, syphilis, rheumatism, and pneumococcal infection. The remaining chapters are devoted to diseases affecting the various systems of the body. In this way the whole ground is covered : but the survey is a very general one, and can only serve as an introduction to the subject. For example, the chapter on tuberculous infections consists of little else than an account of the various pathological lesions, and contains far too little of clinical description. It must be said, however, that the outlines of the subject are clearly presented, and that there are many good photographic illustrations.

Diseases of the Skin. By WILLMOTT EVANS. Pp. 367. London : Henry Frowde, and Hodder & Stoughton. 1913. Price 10s. 6d. net.

ALTHOUGH ostensibly only an introduction to the subject of skin disease, this volume also takes up most of the rare conditions, and we feel that it might have been better not to attempt to include these last, even with a brief description. The subject-matter is good, and the photographs, of which there are thirty-one, are distinctly above the average. For the illustration of diseases of the skin a well-reproduced photograph is better than the still unsatisfactory results of colour photography. Omissions such as the treatment of seborrhœa of the scalp in acne and rosacea and the use of hydrarg. perchlor. in lichen occur, and crude tar, a most valuable modern remedy, is not mentioned. What is given is given clearly, and this especially applies to the description of the clinical appearances of the various diseases, but we consider that the author could write a better book if he made it larger and let his evident deep knowledge well out. For those who have a forgotten past of lectures on diseases of the skin it will readily recall facts, but for the tyro it does not go deeply enough into elementary points.

The X-Ray Treatment of Skin Diseases. By Dr. FRANK SCHULTZ. Translated by JAMES BURNET, M.A., M.D., M.R.C.P. Pp. 162. London : Rebman, Ltd. 1912. Price 12s. 6d. net.

THE original German edition gives a good description of the X-ray apparatus and technique which the author recommends in the treatment of skin diseases The author's own schemes for treating the different groups of diseases are clearly stated, and the arrangement is such that reference to any one particular disease is easy. The section on the relation between the specific weights of the different tissues and their susceptibility to the X-rays throws valuable light on the reason why some cases do well on X-ray treatment, whereas others, clinically identical, do not. The illustrations are numerous and good. Unfortunately the English edition suffers greatly at the hands of the

translator. It is written throughout in German-English, and in places is quite unintelligible. There are passages where the translator has entirely failed to grasp the meaning of the author. The following sentence :—" Zur Bestrahlung der Prostata sind besonders gefensterte Bleiglastuben konstruiert, man kommt aber auch ohne diese mit Bestrahlung des Dammes in Knie-ellenbogenlage aus," is translated " For radiation of the prostate, lead-glass tubes with windows are specially constructed. Even without these one can manage the radiation of females in the knee-elbow position." Other similar mistakes could be quoted. We can thoroughly recommend the original German edition, but such errors as we have mentioned make the English edition more or less worthless.

Tuberculin in Diagnosis and Treatment. By LOUIS HAMMAN and SAMUEL
    WOLMAN, Johns Hopkins University. Pp. 384. New York and
    London : D. Appleton & Co. 1912. Price 12s. 6d. net.

THE greater part of this volume is taken up with tuberculin in diagnosis, and as a résumé of the bibliography of the subject it is excellent. As in the preface, however, the authors state that the book is primarily intended for the use of general practitioners and students, we think it unfortunate that so much space should have been occupied with extensive extracts and statistics from numerous writers. The names mentioned are legion, and the opinions quoted are too contradictory to be helpful or illuminating to the beginner in this field of study. A mere reference to the relative importance of the various tuberculin tests and to the value of the quantitative tuberculin test would have sufficed in the present rather chaotic state of our knowledge on the subject.

Of the part of the book dealing with tuberculin in treatment we can speak with warm approval. It is clear, terse, and vigorous, and the authors have shown a wide and tolerant attitude to the two different methods of administration.

The section treating of the scientific principles underlying the use of tuberculin and the chapters relating to treatment should be of very great help to those anxious to gain a knowledge of the subject and its literature.

On Alcoholism : Its Clinical Aspect and Treatment. By FRANCIS HARE,
    M.D. Pp. 269. London : J. & A. Churchill. 1912. Price 5s.

DR. HARE'S book is throughout thoroughly practical, and can be commended as an eminently moderate and sensible guide to the subject of alcoholism. The chapters on classification are good, and Dr. Hare does not underestimate the difficulty. Typical cases are easily placed, but the borderland between the classes is wide. The rigid classification of true dipsomania and its recognition as something apart and distinct from all other forms of alcoholism cannot be too much insisted upon.

The chapters on tolerance and intolerance and their relation to treat
ment and complications are specially good.   The greater the degree of
tolerance the more the necessity for careful "tapering" and the more
the risk of delirium on sudden withdrawal or even a considerable
reduction in the circulating alcohol.   This view is by no means
universally held, but Dr. Hare makes out a very good case.   As Dr.
Hare points out, it is the chronic drinker, he who has established a high
degree of tolerance, who gets complications on withdrawal.   It cannot
be too strongly stated, both as a matter of fact and as a matter of policy,
that the word cure cannot be applied to alcoholism whatever the treat-
ment, because then the inebriate would be able to resume life as a
moderate drinker, which he cannot do.   The results of treatment are
most hard to estimate, and Dr. Hare's method of simply tabulating the
cases as when last heard of seems the only way, but it is impossible to
deduce anything from a percentage when the periods range from one
month to two years and over.

Cyclopædia of American Medical Biography from 1610 *to* 1910.   By
        Howard A. Kelly, M.D., Two Vols.   Pp. 969.   London :
        W. B. Saunders, Co.   1912.   Price 42s. net.

In these two volumes the editor, who has had the assistance of over
two hundred collaborators, aims at giving a brief outline of the life of
every "medical worthy who has lived in the United States and
Canada," and by the term "worthy" he understands a man who has
been distinguished as a thinker, or writer, or teacher, or great leader
of medicine.   With so wide a field and so great a number of workers
it is inevitable that there should sometimes be disparity in treatment
of the different names, but the biographies are in the main wonderfully
comprehensive as well as concise.   The work will naturally be of greater
interest in America than in Europe, where many of the subjects of
biography are unknown even by name, but it forms an admirable guide
to the more celebrated lives like those of M'Dowell, Senn, Agassiz,
etc., as well as affording many vivid pictures of the former conditions
of practice in the States.   One is disappointed now and then, as, for
example, by the very brief notice of Morton, the introducer of ether
anæsthesia ; and since the book only deals with those deceased before
the end of 1910, many of America's most valued sons are unavoidably
omitted.   The plan of giving at the end of each biography references
to articles and books that contain fuller details is a good and valuable
feature of the work.   While a dictionary, even of biography, cannot be
perused from cover to cover, the reader's interest is constantly stimu-
lated by articles of high literary merit, and even the notices of some
obscure characters are written with a vivacity or humour that com-
mands attention.   The volumes will form a work of reference indis-
pensable for medical libraries, and highly appreciated by all interested
in the development of American medicine.

Text-Book for Nurses. By E. W. Hey Groves, M.S., F.R.C.S.E., and
J. M. Fortescue-Brickdale, M.A., M.D. Pp. 407. 205 Illustrations. London: Henry Frowde, and Hodder & Stoughton.
1912. Price 12s. 6d.

THIS pretentious volume aims at providing nurses with a guide and
supplement to the courses of systematic lectures on Anatomy, Physiology, Medicine, and Surgery. With the details of ward work, on which
many text-books are already in existence, it does not concern itself.
The book is divided into three sections, of which the first gives a more
rational summary of anatomy and physiology than is usually encountered in manuals adapted for nurses. A wise selection has been made
of such facts as are of importance in their application to the clinical
subjects. The second section deals in turn with general and regional
surgery, and in the third medicine is treated on the same lines. One
of the book's chief claims to distinction is the manner in which it is
illustrated. Most of the figures are culled from various volumes of the
publishers' extensive medical library, and for clearness and descriptive
purposes they can scarcely be improved on. Many instruments and
much medical and surgical apparatus are also figured. The letterpress
is concise and yet readable, and much attention has been devoted to
secure accuracy. Apart from misspellings of proper names, the only
slip that we have noticed is in the legend to Fig. 110, in which the
point X does not represent the spot at which the needle should be
introduced for lumbar puncture. We can with confidence recommend
the work as a text-book for examinations, and as a book of reference
for trained nurses in medicine and surgery.

Zoology: A Manual of Elementary Zoology. By L. A. Borradaile, M.A.,
Lecturer in Zoology in the University of Cambridge. Pp. x. +
470. 301 Illustrations. London: Henry Frowde, and Hodder
& Stoughton. 1912. Price 10s. 6d. net.

THIS book is an important addition to the choice of text-books of
zoology already at the disposal of junior students. The subject is
treated according to the type system, and after some introductory
remarks on the animal organism in general the work commences with
a detailed account of the frog, extending over four chapters and
occupying about a fifth of the whole volume. This is followed by a
description of the lower forms from amoeba to hydra, then a general
chapter on reproduction and two on worms lead up to the crayfish, cockroach, mussel, and amphioxus. The vertebrate types considered are,
as usual, dogfish, pigeon, and rabbit, followed by a short account of
mammalia as a whole. A special section is devoted to embryology,
while the last chapters are concerned with classification and the relations existing between animals and other organisms. In a work which
will probably be largely used by students of medicine, we welcome the

increased attention paid to microscopic structure ; the chapter devoted to the tissues of the frog should prove a valuable introduction to the future study of human histology. The illustrations, of which about two-thirds have been specially prepared, constitute an important feature of the book. The line engravings and diagrams are well defined, not overcrowded with detail, and, along with the numerous half-tone reproductions from drawings of dissections, add greatly to the attractiveness of the whole. For the rest the author's style is interesting, the type clear, and the paper good. Taking it altogether the book is one to be wholly commended.

NEW EDITION.

Lateral Curvature of the Spine and Round Shoulders. By ROBERT W. LOVETT, M.D., Boston. Second Edition. Pp. 190. London : Rebman, Ltd. 1912. Price 7s. 6d.

THE great advance which has been made during the last few years in the knowledge of the etiology of this condition and the prominent position recently taken by the "forcible corrective" treatment of lateral curvature have necessitated the revision and partial rewriting of this very able book, the first edition of which only appeared about five years ago.

The book is an exhaustive study of the subject in all its aspects, and possesses a very complete bibliography. The theoretical side is dealt with at considerable length, and a large number of tables of statistics on points of importance are given. The practical side of the question is also treated thoroughly, though perhaps not so minutely. All the commoner and more useful exercises are fully described, and their relative merits and applicability in different cases discussed. As is to be expected in this edition, a considerable space has been devoted to the subject of " forcible correction." The scope and limitations of this method of treatment are outlined clearly and dispassionately. Descriptions of various methods employed by other surgeons are shortly mentioned, while that practised by the author is given in detail. We should perhaps have liked to have had rather a more complete and definite statement on the results obtained by these different methods, but possibly this may have been impracticable. For instance it would have been of interest to hear how the results of Abbot compare with those of the author, for the former holds that the greatest and most rapid correction can be obtained with the back flexed, while the latter uses the extended position. One of the most salient features of all the recent methods of forcible correction is the adoption of the horizontal position of the body and the rejection of head extension during the application of the plaster jacket. It is shown most conclusively that head traction—that is traction in the long axis of the body, as when a patient is suspended in a Sayres head-

sling—actually renders the reduction of the deformity very much more difficult, for the tension in the long axis of the spine renders it more or less stiff and immobile.

The writer, while entirely believing in the purely gymnastic treatment in given cases of postural and slight structural scoliosis, most rightly depreciates the routine use of this treatment in moderate and severe cases of the structural type. He points out that in these cases gymnastics pure and simple may actually do harm, for if the exercises are efficient the spine is speedily rendered more flexible, and if it is not then supported it will at once sink into a worse position than before, with a corresponding exaggeration in the curve, as the flexibility of the spine increases much more rapidly than the holding power of the muscles.

We can heartily recommend this book to all those interested in the subject of lateral curvature and its allied conditions, and would suggest that those surgeons who still do not believe in corsets or corrective jackets should take an early opportunity of looking through its pages. While some of the chapters may be more of interest to the specialist, those dealing with the practical part of the subject will be read with interest by all.

The book as a whole is well got up, the numerous illustrations are good, and the letterpress is remarkably free of misprints and " Americanisms."

NOTES ON BOOKS.

The Prognosis and Treatment of Diseases of the Heart, by R. O. Moon, M.A., M.D., F.R.C.P. (pp. 111, London, Longmans, Green & Co., 1912, price 5s. 6d.). Many excellent and useful indications for the prognosis and treatment of cardiac affections are discussed in this little book, which deals with valvular lesions, myocarditis, angina pectoris, functional disorders, tachycardia, and certain special symptoms. The subjects are considered in an essentially practical manner, without any undue emphasis being laid on recent cardiological teaching. We can recommend the book as a sound, practical, and concise guide to the treatment of diseases of the heart.

Arteriosclerosis, by Louis M. Warfield, A.B., M.D. (second edition, pp. 220, London, H. Kimpton, 1912, price 10s. 6d.). In the second edition of this book a number of changes and additions have been made. The chapters devoted to the consideration of the physiology and pathology of the blood vessels have been rewritten, and new sections have been added on physical examination and on arteriosclerosis in relation to life assurance. It is evident that the author is more familiar with the views and writings of his own countrymen than with those emanating from European sources, and some aspects of arterial disease are dealt with somewhat cursorily. On the

whole, however, the text presents a brief and reliable account of our present-day conceptions of arteriosclerosis. The illustrations are clear and well chosen.

Mr. W. Harrison Martindale's little book, *Digitalis Assay* (H. K. Lewis, 1913, price 2s.), contains a useful critical review of the methods available for digitalis assay. The author takes up the position that methods involving vivisection for routine assay are to be deplored, and that the pharmacist should, if possible, be able to assay all the drugs he dispenses. He has therefore introduced a method of testing tincture of digitalis based on a colour reaction, the depth of colour corresponding to the degree of physiological activity. The procedure is thus based on the very methods the author deplores, and to be of any value it must, we imagine, be frequently checked by physiological experiment. The physician prescribes medicines for their physiological effects. If the pharmacist can demonstrate the active principle which causes these effects the prescribers will gladly accept his assay, but in the absence of a defined active principle we doubt the advantage of a mere colour test based on physiological experiment over the direct result of the experiment itself.

BOOKS RECEIVED.

ALDERSON, W. E. Dental Anæsthetics. Second Edition . . . (*Wright & Sons*) 3s.

ALLEN, R. W. Bacterial Diseases of Respiration, and Vaccines in their Treatment
(*H. K. Lewis*) 6s.

BEATSON, G. T. Modern Wound Treatment and the Conduct of an Operation
(*E. & S. Livingstone*) 2s.

COLLIE, J. Malingering and Feigned Sickness . . . . . (*Edward Arnold*) 10s. 6d.

ELLIOT, R. H. Sclero-Corneal Trephining in the Operative Treatment of Glaucoma
(*The Ophthalmoscope Press*) 7s. 6d.

FREUD, S. Selected Papers on Hysteria. Second Edition
(*Journal of Nervous Diseases Publishing Co.*) 2 dols. 50 cents.

HANNA, WM. Studies in Smallpox and Vaccination . . . . (*Wright & Sons*) 7s. 6d.

HUMPHRIS, F. H. Electro-Therapeutics for Practitioners . . . (*Edward Arnold*) 8s. 6d.

HUTCHISON, R. Lectures on Diseases of Children. Third Edition . (*Edward Arnold*) 10s. 6d.

INDEX-CATALOGUE of the Library of the Surgeon-General's Office, U.S. Army. Second Series.
Vol. XVII. . . . . —

JELLETT, H. A Short Practice of Midwifery. Sixth Edition . . (*J. & A. Churchill*) 10s. 6d.

LEFTWICH, R. W. Tabular Diagnosis . . . . . . (*Edward Arnold*) 7s. 6d.

M'LEOD, J. J. R. Diabetes: Its Pathological Physiology . . . (*Edward Arnold*) 10s. 6d.

MOULLIN, C. M. The Bradshaw Lecture on the Biology of Tumours . . (*H. K. Lewis*) 2s.

NISBET, J. D. The Insanity of Genius. Sixth Edition . . . . . (*S. Paul*) 5s.

PATERSON, H. J. The Surgery of the Stomach . . . . . . (*Nisbet & Co.*) 12s. 6d.

ROEMER, P. Text-Book of Ophthalmology. Vols. II. and III. . . (*Rebman, Ltd.*) 21s.

RUMPF, TH. Arzt und Reichsversicherungsordnung. 1912
(*Marcus & Weber's Verlag, Bonn*) 3 mks.

STEPHENSON, S. Eye-Strain in Everyday Practice . . . (*The Ophthalmoscope Press*) 3s. 6d.

STRUBELL, A. Das Wechselstrombad . . . . . (*Steinkopff, Dresden*) 7 mks.

THE Medical Annual, 1913 . . . . (*Wright & Sons*) 8s. 6d.

THORINGTON, J. Retinoscopy. Sixth Edition . . . . (*Rebman, Ltd.*) 4s. 6d.

TRANSACTIONS of the Thirty-Fourth Annual Meeting of the American Laryngological
Association, 1912 . . . . (*New York*) —

WHITE, W. A. Outlines of Psychiatry. Fourth Edition
(*Journal of Nervous Diseases Publishing Co.*) 3 dols.

WILLIAMS, L. Minor Maladies and their Treatment. Third Edition
(*Baillière, Tindall & Cox*) 5s.

ZINSSER, F. Diseases of the Mouth . . . . (*Rebman, Ltd.*) 30s.

EDINBURGH
MEDICAL JOURNAL.

EDITORIAL NOTES.

The Need for a Crusade against Syphilis.

In view of recent advances in our knowledge of syphilis the time is ripe for a concerted fight against the disease. Diagnosis is now a certainty, and treatment is becoming an exact science—facts which justify the belief that were the same efforts made to prevent syphilis as have been made to prevent tubercle, as great, or perhaps greater, success would follow. The reasons why so little has yet been done are clear. While the ravages of tubercle are manifest and direct, obvious to every doctor and understood by every layman, the damage done by syphilis is remote, less appreciated by practitioners, and unknown to the man in the street. Syphilis bulks more largely as a cause of disease in the eyes of the neurologist, of the oculist, of the surgeon, than in those of the general practitioner. To the latter it is one of the diseases amenable to remedy, to the specialist in almost every branch of medicine it furnishes some of his most hopeless cases. In a word, everyone has personal experience of a great deal of what tuberculosis does, very few see the whole of syphilis.

No less important a reason is the moral aspect of the question. This, more than aught else, hides from the public what syphilis, unchecked, can do. Humanity forbids that a patient, still more his relatives, be told the real cause of such an incurable disease as tabes, hence the laity have no idea how many quite respectable maladies are syphilitic. What the foreigner calls prudery, but what is to our minds bare decency, operates in the same direction, by preventing any save veiled reference to syphilis in public.

Signs are not lacking, however, of an awakening. In the discussion on syphilis in the Royal Society of Medicine last October the emphasis laid on the public health aspect of the disease was noteworthy, and a committee was appointed to investigate. Nearer home, too, Dr. Robertson spoke very strongly on the subject in the last report of the Edinburgh Royal Asylum and in the Morison lectures. Generally, prophylaxis against syphilis will fall under two heads— administrative and educational.

Of administrative control there is this to be said. It is admitted that hitherto the class of measures typified by the Contagious Diseases Acts have, at least in civil life, brought more evil than good in their train, and in any case public opinion would not tolerate their re-enactment. They have been in the main police restrictions; they have been applied solely to the prostitute. The administrative control of the future, which will involve notification, treatment, and possibly

segregation, must be medical, not through any *police des mœurs*, and to be effectual must apply to both the sexes. Syphilis must be envisaged as an infectious disease, and must be dissociated so far as possible from questions of ethics or retributive justice.

Administrative control can only exist in virtue of a favouring public opinion, and public opinion can only be aroused by education. It is the duty of the medical profession to speak plainly to the public, and then the responsibility will rest on them. It is necessary, above all, that young men be acquainted with the risks of syphilis, and that appeals should be made to them on hygienic as well as on ethical grounds. The hard fact has to be remembered that the moral argument applies very unequally, since not all, by any means, have to face the same temptation, while the argument of health appeals to all alike. Moreover, only by keeping ethics in the background can we avoid branding innocent sufferers, and they are many, with the added stigma of disgrace. The frame of mind in which Lecky wrote of " the unhappy being whose very name is shame to speak " as " the supreme type of vice, she is ultimately the most efficient guardian of virtue," befits the historian of morals but not the sanitary reformer.

An educational propaganda, besides guiding public opinion as to the requisite administrative measures, would directly lessen syphilis. This is not mere conjecture ; we have the experience of the Indian Army on our side. In 1896 the admission ratio per 1000 for venereal diseases was 511, for syphilis 97 ; in 1910 it was 58 and 14 respectively. The improvement is due to two causes—the cantonment regulations of 1897, and a series of advisory memoranda issued by successive commanders-in-chief, inculcating temperance and self-control. It is the opinion of those best qualified to judge that the instruction and advice given to young soldiers under these memoranda have been as instrumental as the regulation of prostitution. In the Report on the Health of the Army for 1911, p. 48, quotation is made from a competent critic who is "amazed at the improvement which has come over the moral tone of the Army," which is " higher in the barrack-room than it is among young civilians in India of the same age as our soldiers." Surely the civil population of the country should not prove more intractable material than the troops in our Eastern Empire.

Rat Cancer and Nematodes. THE relationship between parasites of various kinds and tumour formations has long been recognised. The example of coccidiosis in the rabbit is perhaps the best known. That parasites can by their presence in the tissues set up malignant growths is also generally admitted. Thus distomum hæmatobium has been found associated with bladder cancer in man, and Borrel, Haaland, and Murray have described the association of nematodes with cancer in animals. Until recently, however, it had not been shown that the experimental introduction of a

parasite into an animal could give rise to a tumour with the character of a malignant growth. This has been done by Johannes Fibiger, Professor of Pathology in Copenhagen. A full description of the experiments will be found in the *Berliner klinische Wochenschrift* of 17th February 1913; a still more detailed account is promised in a forthcoming number of the *Zeitschrift für Krebsforschung*.

The origin of the investigations which led up to this important discovery was an observation made by Fibiger as far back as 1907. He was carrying out some experimental work in tuberculosis, and he noticed in three wild rats a papillomatous condition of the stomach which on microscopic examination showed the appearances of a squamous epithelioma but without the production of metastases. It was found on more careful examination that nematode worms were present in the interior of the tumour. Experiments were made by inoculation and feeding with a view to the reproduction of the condition in other rats, but these all failed.

The three affected animals were obtained from the same source in Dorpat. A careful examination of 1144 rats, partly wild, partly laboratory animals, showed neither tumours nor nematodes. At last, however, the author chanced upon a strain of rats (from a sugar refinery) in 40 of which, out of a total of 60, nematodes were found in the epithelium of the fundus of the stomach. These nematodes resembled those found in the tumour cases, and in 9 rats of this new series tumours were found in the stomach in association with the nematodes.

From the negative results of the feeding experiments in the first animals the parasites clearly could not be directly transmitted. An intermediate host was thus indicated. In searching for such a host the investigator struck upon the cockroach, these animals being closely associated with the rats in the sugar refinery.

Fifty-seven rats were then fed upon cockroaches obtained from the sugar refinery. These rats were kept in cages, and as they died off naturally were carefully examined. In three of them nothing abnormal was found, but in 54 nematodes were discovered in the stomach wall. Of the 54 nematode-containing animals 36 showed lesions of the stomach mucous membrane representing various stages in the development of epithelial tumours. In seven cases tumours similar to those in the original three rats were found. Although, as a rule, the appearances of the tumour were more those of a papilloma, in four cases the resemblance to a squamous epithelioma was complete, and in at least two, possibly in three, metastatic growths were found in lung and lymph glands. These metastatic growths did not contain nematodes.

Fibiger was able to demonstrate fully the life history of the parasite by finding the eggs in the faeces of rats. By feeding cockroaches with the faeces, after six weeks the embryos are found coiled up in the muscles of the prothorax and limbs.

The importance of the above observations, as already indicated, and as pointed out by Bashford, is that for the first time malignant growths with secondary deposits have been produced experimentally in animals by inoculation with a parasite irritant. Indeed, with the possible exception of the X-rays, it is the first time that the connection between cancer and an irritant of any kind has been demonstrated experimentally. In all probability it is merely as any other irritant—paraffin, heat, X-rays—that such parasites act, although it is possible that, as Borrel holds, the nematode or other parasite may be merely a carrier of a specific cancer virus.

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Honour to Sir Thomas R. Fraser.

Sir Thomas R. Fraser, M.D., F.R.S., Professor of Materia Medica and Clinical Medicine in the University of Edinburgh, has been elected a member of the Athenæum Club under the special rule authorising the Committee to elect nine members in each year, because of their "distinguished eminence in science, literature or the arts, or for public services." We offer our congratulations to Sir Thomas Fraser on this honour.

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The late Professor Hugh Angus Stewart.

It is with great regret that we have to record the sudden death, on the 29th March, of Hugh Angus Stewart, M.D., F.R.C.P., Adjunct Professor of Pathology in Columbia University, New York, in his 31st year. After being Resident-Physician in 1905 to the wards under the charge of Dr. Gibson in the Royal Infirmary, Dr. Stewart proceeded to the Johns Hopkins Hospital, where he became attached to the clinic of Professor Thayer, and subsequently to Columbia University. By his series of remarkably able contributions to medical literature, and more particularly by his "Experimental and Clinical Investigations of the Blood and Pulse Pressure Changes in Aortic Insufficiency," Dr. Stewart had already achieved the reputation of being one of the most brilliant young graduates of our University. Yet it was not this but rather his keen enthusiasm for work, his optimism, and genial personality that endeared him to his friends.

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Appointment.

Dr. J. D. Comrie has been appointed Assistant-Physician to the Royal Infirmary.

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Presentation to Dr. George Mackay.

On the occasion of his retirement from the post of Ophthalmic Surgeon to the Royal Infirmary, Dr. George Mackay was entertained to a complimentary dinner by his old house-surgeons and a group of intimate medical friends and colleagues. Lieutenant-Colonel Sir Joseph Fayrer, Bart., Superintendent of the Royal Infirmary, presided at the dinner.

In the course of the evening Dr. Mackay was presented with a silver rose-bowl bearing the following inscription:—"Presented to

George Mackay, Esq., M.D., F.R.C.S.E., by his old House-Surgeons as a mark of their esteem and of their admiration of his brilliant work as Ophthalmic Surgeon to the Royal Infirmary."

In making the presentation on behalf of the old house-surgeons Dr. J. V. Paterson said that in neither this country nor on the Continent had he met a more brilliant operator or sounder clinician than their old chief.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, and Royal Faculty of Physicians and Surgeons of Glasgow.

At the quarterly examinations of the above Board, held in Edinburgh in January 1913, the following candidates passed the first examination :— U. R. Hattiangadi, India ; Iwan Davies, Llandyssul ; L. H. Peries, Ceylon ; and J. T. Whicker Gale, Australia.

The following passed the second examination :—A. G. M'Kee, Co. Monaghan ; J. L. Hendry, Aberdeen ; Percy Chisholm, New Zealand ; A. G. Bee, N. Wales ; C. E. S. Runciman, Sheffield ; F. H. A. Stegmann, Melbourne ; R. V. Clarke, Cheshire ; H. A. G. Dykes, Dumfries ; James Fitzpatrick, Glasgow ; E. H. B. Coghill, Killiney ; J. P. Fairley, Leith ; J. H. Blackburn, Edinburgh ; H. R. Fisher, Edinburgh.

The following passed the third examination :—Florence W. Heyworth, Liverpool ; S. A. Faulkner, Sale ; John Corcoran, Cork ; K. A. Deodhar, India ; J. R. Fleming, Airdrie ; E. C. Brooks, India ; W. S. O'Loughlin, Limerick ; Cyril Popham, Co. Cork ; and A. W. Cochrane, Glasgow.

The following, having passed the final examination, were admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P.&S.G. : — Ernest Wilfred Ingle, Port Elizabeth, S. Africa ; William Laird, Larkhall ; Balajipet Seshachalam, Madras ; James Williamson, London ; Pietro Giuliani, Albany, U.S.A. ; Isabel Quambrough, Karachi, India ; William Ayrton Strathearn George, Bombay, India ; Emanuel Olubomi-Beckley, West Africa ; Timothy Sheehan, Co. Cork ; John Edward Rees, South Wales ; and Hubert Walter Ward, Glasgow.

At the quarterly examinations held in Edinburgh, in April 1913, the following candidates passed the first examination : F. J. D. Cass, Edinburgh ; F. E. Gillieron, Folkestone ; Martha H. Hoshing, British Guiana ; Edwin Butler, Katesbridge, Bournemouth ; W. A. Mein, Bombay ; and E. A. Hamilton.

The following passed the second examinations :—J. J. Armistead, Kirkcudbright ; W. C. Bowie, Edinburgh ; F. B. Macaskie, Bamburgh. With distinction, S. W. Hoyland, Ipswich ; and J. V. R. Rohan, Mauritius.

The following passed the third examination : A. Craig, Perth ; O. Stewart, Edinburgh ; A. F. Readdie, Edinburgh ; M. M'L. Bainbridge, Roxburghshire ; and Maheput Seeraj, British Guiana.

The following, having passed the final examination, were admitted L.R.C.P.E., L.R.C.S.E. L.R.F.P.&S.G. : Samuel Wright, Belfast ; James Garney Lessey, Grenada ; William Austin Reardon, Rangoon ; Balapershad Shiv. Raj, Hyderabad ; Kathleen Gladys Wall, Burma ; John Stewart Edwin, de Soysa, Ceylon ; George Agincourt Hodges, Melbourne ; Andrew Chambers Fleming, Dunedin, N.Z. ; John William Craig, Berwick-on-Tweed ; William Brennan, Co. Clare ; Edward Ercell Steele, Grenada, B.W.I. ; James Alexander Whitla, Monaghan ; and Stanislaus Brennan, Co. Clare.

THE CAUSATION AND TREATMENT OF DEFORMITIES FOLLOWING ANTERIOR POLIOMYELITIS.

By B. P. CAMPBELL, M.D.(Camb.), F.R.C.S.(Edin.).

I.

General Considerations.

ANTERIOR poliomyelitis or, to use its popular name, infantile paralysis, is a disease which has received much attention in recent years, and the reason is easily understood if we keep in view its frequent occurrence and the only too common memento of its visit which it leaves behind in the form of a useless or severely crippled limb.

We do not fear a formidable death-rate, because the number of those who die from the direct effects of the disease is few compared with those attacked, but what raises our alarm is its terribly crippling effect. But few of those whom it attacks escape without any reminder of the visit, while the vast majority carry about a crippled limb which remains as a lasting handicap in whatever walk of life they follow. When this fact is realised, and the further consideration that almost all the victims are children, and therefore those who are commencing their struggle for existence, the work of those who are striving to overcome its baneful effects will be appreciated.

The object of the present paper is merely to deal with a small but very important part of the subject, namely, to consider the means at our disposal for the correction or amelioration of the deformities which remain as a result of the disease.

Pathology.—The pathological changes which result from the destruction of the ganglion cells of the anterior cornua of the cord are explained by the law that when a nerve cell is destroyed, or a nerve fibre which is a process of a nerve cell is divided or otherwise obstructed, those parts distal to the portion containing the nucleus degenerate. Motor impulses are cut off, and those muscle fibres supplied by the affected nerve fibres are paralysed. Not only is this the case, but through loss of their trophic control they undergo rapid granular degeneration, and in time are replaced by fibrous tracts, while the bones in the part are frequently markedly shortened and thinner than normal; possibly disuse plays some small part in the production of these changes. The break in the reflex arc causes abolition of the reflexes in the affected area, but

there is very seldom any alteration in sensation or in the reflexes of the bladder or rectum. There is a disturbance of the subsidiary vasomotor centres, situated in the grey matter of the cord and presumably near the anterior cornua from the regularity with which it occurs. These spinal centres are under the control of a governing centre in the floor of the fourth ventricle; its fibres pass down in the lateral columns of the cord, and terminate by arborising round the cells of the spinal centres, the axis cylinders of which pass out in the anterior nerve roots. Frequently a number of muscle fibres in the paralysed muscle escape and do not undergo degeneration, and it is through hypertrophy of these that some recovery occurs at a later period, according to the number present.

Symptoms.—In outlining the pathology I mentioned most of the symptoms which appear as a result of the disease, namely, motor paralysis, loss of reflexes, rapid wasting of the affected parts, and, in the case of limbs, the bones are frequently shortened and of small size. In consequence of the vasomotor disturbance the part becomes pale or bluish coloured and colder than normal. There are other symptoms which occur during the initial febrile stage of the disease, but they do not concern us here. They are the usual symptoms which usher in any febrile condition in children, namely, rise of temperature, fretfulness, often diarrhœa and vomiting, and sometimes convulsions. Some epidemics are characterised by very severe initial symptoms, while in some sporadic cases they are scarcely noticeable.

Prognosis.—The prognosis as to death, as already stated, is not bad. In sporadic cases and in mild epidemics the death-rate may be as low as from 2 per cent. to 5 per cent., but in some of the more virulent epidemics it will rise to over 20 per cent.

The prognosis as to recovery of the parts depends on the extent of the destruction of the ganglion cells and the number that regain power. Many are no doubt at first put out of action by pressure from the extravasation, but when this passes off they gradually regain their function. This fact probably accounts for the strong tendency to spontaneous recovery in the early stages of the paralysis. Where muscles are partially paralysed the prognosis as to recovery depends on the treatment adopted and whether they are placed in the best possible position for recovery, but when muscles are totally paralysed nothing will restore them to activity, as their motor fibres are completely destroyed.

The above brief outline of the disease in no way pretends to represent a complete consideration of the subject, but is merely

meant to serve as an introduction, and I have been compelled for want of space to make my description as short as possible.

The Causes of Deformity.

First let us consider the nature of the deformities and how they are produced, and then we shall be in a better position to understand the means of preventing their occurrence or of coping with them once they are present, and for purposes of simplicity I divide them into two main classes—

Trophic Deformities.—The first class comprises those which occur as a direct result of the cutting off of trophic influence from the part. They are unpreventable, and are bound to occur if the ganglion cells are destroyed. Thus a short and much wasted limb, perhaps several inches shorter and very much smaller in circumference than its neighbour, and pale or bluish in colour, with thin and smooth skin, may appear quite straight and not drawn into any of those unnatural positions which the mind usually associates with deformity, but there is very evident deformity in the shape of shortening and wasting. In some few cases[1] the paralysed limb has been found to measure an inch or two longer than its neighbour, notwithstanding the extensive paralysis and wasting of the muscles. I have noted no cases of this kind, but mention the fact to show that shortening of the part is not invariable. In the vast majority of cases, however, there is shortening in the paralysed limb, amounting from one inch or less to as many as six or seven inches. The shortening of the bones generally occurs in the segment of the limb in which the muscular paralysis is most marked. Thus the femur would be shortened in a case in which the quadriceps extensor muscle was paralysed, and the tibia where the peroneal muscles were those most affected. In cases involving the lower extremity I have frequently been able to demonstrate this by comparing the lengths of the femora and tibiæ on the two sides. Another point in this connection is that, while it is usually true that the more marked the muscular paralysis the greater the shortening in the limb, some cases of extensive paralysis occur in which there is found to be a mere fraction of an inch of difference in length, while in other cases where only one group or one muscle of a group is involved the shortening amounts to as much as three or four inches. It is not clear why this should be so, but I mention it as an important point to bear in mind when giving a prognosis.

There is not much to be said about the treatment of these

trophic deformities. There appears to be no preventive treatment, since they must occur if the controlling ganglion cells are destroyed. Wasting may be improved to a certain extent if the muscle partially recovers and is treated on the lines laid down later, while the shortening may be compensated for by employing a thicker sole for the boot; also, on the supposition that disuse has a hand in their causation, suitable exercises and use of the limb should be encouraged.

Preventable Deformities.—The preventable deformities form the second class, and may appear any time after a few weeks from the onset of the paralysis. They are called preventable because they are not directly due to the paralysis, but are brought about by outside causes acting on the weakened parts. This paper proposes to deal with special reference to this class, and to show what steps should be taken to prevent their occurrence, or how they may be rectified when present.

In order to understand how they are brought about we must realise that every limb has its natural position of rest, in which the muscles on the opposite sides of the limb, that is, on the flexor and extensor aspects, are in perfect balance with one another, and maintain the limb in this position without any undue effort. This property of the muscles of counterbalancing one another is called their "tone," and is governed by nervous influence. Thus in the upper extremity the natural position of rest is with the elbow extended, the forearm midway between pronation and supination, and the fingers slightly flexed; in the lower extremity the knee is very slightly flexed, and the ankle slightly plantar-flexed. This tonicity enables the muscles to maintain the limb in the position of rest, even if the force of gravity acts in the opposite direction. This can be tested by moving the arm into various positions without making any effort. Should there be an absence of tone—for example, through separation from nervous influence—they will be unable any longer to exert this power.

Herein lies the fundamental principle of the causation of these deformities, and on a thorough grasping of this point depends their prevention and treatment. They are not primarily caused, as has been asserted, by unbalanced muscular action, that is, by one group of muscles in a limb being partially or completely paralysed, and therefore unable to withstand the action of the undamaged antagonistic muscles on the opposite side of the limb. The sole function of the ganglion cells of the anterior cornua of

the spinal cord is not merely to cause contraction of a muscle, but just as much its relaxation. The cells governing the unaffected or antagonistic muscles are healthy, and therefore why should they lose their power of causing relaxation and yet retain that of causing contraction? The argument hardly seems sound. A practical example is the case of a lower limb in which all the muscles acting on the ankle are paralysed, and muscular tone is therefore equally abolished all round the limb. The foot will not remain in its natural position of rest when the patient is recumbent, but drops forwards into a position of plantar-flexion, the reason for this being easy to see, namely, the action of gravity. We frequently meet with cases of deformity in which we can manipulate the part into its normal position without meeting with any resistance from the unaffected antagonistic muscles, thus showing they are not contracted. We do not pretend to deny that at a later period uneven muscular balance plays a very important part in the maintenance and exaggeration of the deformity, but would merely insist that it is not primarily responsible for its presence.

When a limb is constantly placed in an unnatural position, through the force of gravity or pressure of the body weight being too powerful for the paralysed and toneless muscles, the antagonistic muscles find themselves relaxed because their points of origin and insertion are approximated. Therefore they contract somewhat to take up a position in which they will regain their tone. Constant repetition of the deformity leads to the new tone becoming normal, and they are unable to relax to their former normal position. At this stage the deformity remains continually present, instead of being constantly repeated. Having once got into this abnormal position, and finding they are never asked to exercise their power of relaxation, the muscles remain in their contracted state, and this induces further changes which involve their structure. Constant contraction and disuse makes them atrophy, and in time permanent fibrous changes take place; in fact a state of contracture develops, and, later, contraction of the fibrous tissue further exaggerates the deformity.

While these changes are taking place in the stronger muscles, the converse is the case with the paralysed, which are gradually more and more stretched, and never able to contract, as they are too weak to overcome the strong opposite pull of their opponents.

Consequent on these muscular changes secondary changes take place in the ligaments of the joints, and finally in the bones.

The ligaments on the side acted on by the contracted muscles are relaxed, and those on the opposite side are stretched. In time the relaxed ligaments contract to accommodate themselves to the new position. The plantar fascia acts in the same way, and contracts to accommodate itself to the hollowing of the sole, brought about by the action of gravity on the front part of the foot. Ultimately, notably in the tarsus, alteration in the shape of the bones takes place, and this causes a fixed and unyielding deformity. Growth is delayed at the points of maximum pressure between the bones, and is most active where the pressure is removed.

Summary of Changes.—Thus the following sequence of changes takes place :—

1. A paralysed muscle or group of muscles, acted on by gravity or body pressure and unable to maintain the part in its normal position.

2. Contraction of the muscles functionally antagonistic to those paralysed, in order that they may accommodate themselves to the altered position caused by 1.

3. The contraction becoming permanent, through their never being called upon to relax.

4. Wasting from disuse, followed by fibrous changes and contracture, which still further exaggerates the deformity.

5. Structural changes in the ligaments, occurring during 3 and 4.

6. Structural alterations in the bones, especially in the tarsus.

Dislocation.—One class of deformity still remains to be referred to, namely, dislocation. This occurs most frequently at the shoulder and hip. In extensive paralysis of the muscles governing the shoulder the weight of the arm stretches the paralysed muscles, which are unable to hold up the limb. Later the ligaments stretch and dislocation easily takes place. Dislocation of the hip may result from weakness of some of the muscles and stretching of the ligaments, the weight of the body on the limb acting as the force.

METHODS OF INVESTIGATION.

The examination of the patient has an important bearing on the treatment, and necessitates our keeping in view some of the points we have just discussed.

The age is of importance, as it may influence the line of treatment adopted. The length of time since the disease started (not since the deformity made its appearance) may indicate the probable condition of the paralysed muscles. This, however, is

no certain guide, and cases of paralytic drop-wrist have been described[2] in which complete recovery took place after a period of more than twenty years. The possibility of recovery depends on whether any vitality remains in the paralysed muscles. The amount of power displayed in the affected limbs should be observed, and whether the gait exhibits any characteristic feature. If the leg is shortened it is important to determine whether this could be compensated for by some mechanical appliance. It is a consolation to remember that the damage must be very extensive before all hope of improvement is given up. Widespread paralysis of both legs will not prevent a patient fitted with suitable appliance from walking, provided a little power remains in one of the hips.

The degree and character of the deformity should be noted, and whether it is caused by gravity or body weight and is reduced easily and without resistance, whether some resistance denotes contraction of the antagonistic muscles, or whether contracture and changes in the ligaments or bones are present.

Electrical Examination of Muscles. — The examination and testing of the muscles is the most important point in connection with the prognosis and treatment. I will not consider the subject of the electrical tests in detail, as it would occupy too much space, but will only touch on a few of the most important points in this connection. To test the muscles and motor nerves accurately is by no means an easy performance, and requires some experience. An anæsthetic is nearly always required for very small children if the information is to be of much value, and we must remember that many of our patients are young children. The test, therefore, is seldom used by busy practitioners, yet I would strongly recommend those who have access to a battery to make use of it frequently, as it gives most reliable information of the condition of the muscles and nerves. A source of electricity that will yield both faradic and galvanic currents is required, and for this purpose I employ a combined battery worked by dry cells. This can be conveniently carried about, and is useful for examining patients in their own homes. To estimate correctly the results obtained from stimulating paralysed muscles, the response of normal muscles and nerves to these stimuli must be understood. Briefly they are as follows:—If the motor nerve supplying a muscle or the muscle itself is stimulated with either faradic interrupted or galvanic continuous current, sharp and rapid contractions are produced as soon as the minimum strength that will cause contraction is reached. All contractions are due to stimulation of

the motor nerve fibres, and not of the muscular tissue direct. In response to the faradic current the contractions follow one another so quickly that they fuse and produce a condition of tonic spasm, but to the galvanic current, unless it is very strong, they only occur on closing and opening the circuit, and the muscle is relaxed during the flow of the current. The minimum galvanic stimulus produces a contraction when the cathode is the stimulating electrode and the current is made, and, under normal conditions, a stronger current is required on making the current if the anode is used as the stimulating electrode.

In anterior poliomyelitis, as already stated, the motor cells of the spinal cord are destroyed or temporarily put out of action and changes take place, to which the term "reactions of degeneration" is applied. The muscles waste and rapidly lose their excitability to the faradic current. If this is applied to the motor nerve or the muscle direct no contractions result, because the muscular tissue is incapable of responding to such quickly repeated stimuli. Galvanic stimulation of the motor nerve has also no effect, as degeneration is taking place and conduction is lost, but when applied to the muscle direct a contraction due to direct stimulation of the muscular tissue takes place, and in character it is slow and sluggish, not sharp and quick like that which was evoked when the motor end-plates in the muscle fibres were stimulated. This alteration in the character of the contraction is very important, but usually other changes are also found to be present. A weaker current generally produces a contraction in muscular tissue, and frequently it is most easily elicited on making the current with the anode as the stimulating electrode.

It is first, therefore, noted whether faradic excitability is entirely lost or only diminished; it is said [3] that if it is lost within a fortnight from the onset of the paralysis, no recovery will take place. Next, the galvanic current is applied and a note made whether the reactions are normal, whether those of degeneration are present, or whether there is no response whatever. Various parts, such as the motor nerve trunks, the points where the motor nerves enter the muscles, and other points on the muscle bellies are stimulated in turn with both currents. The muscles under observation should be under no tension, and the electrodes should be kept well moistened.

The reactions of degeneration are present for so long a period as the muscular tissue alone is capable of responding to the stimuli, that is, either until the nerve fibres recover and the reactions

become more or less normal, according to the amount of recovery, or until the muscular fibres degenerate, in which case complete paralysis remains, and they gradually cease to respond to any stimuli.

Other Muscle Tests.—In introducing the subject of electrical tests, I said they were not likely to become everyday tests of the medical practitioner, because of the various difficulties they presented ; fortunately there are other means of ascertaining with fair accuracy the condition of the paralysed muscles, although I admit they are not so sound or scientific.

The paralysed muscles can generally be identified by noting the sites of greatest wasting, what deformity is present, what movements can be accomplished, and comparing these with what should normally be present.

I have already mentioned that deformity is much aggravated by the continual overstretching of the weakened muscles, which do not receive a fair chance of recovery, and this is probably the most important lesson to be learnt in connection with treatment which depends almost entirely on their condition. To ascertain whether the muscles are really paralysed or only overstretched and apparently paralysed, the patient should be asked to attempt some voluntary movement. If the faintest movement results, we can be assured that very marked improvement will take place under appropriate treatment : but if there is not even a flicker, the existing deformity should be still further exaggerated by gentle pressure, which gives the paralysed muscles a better chance of responding,[4] and the patient is again asked to carry out the desired movement. If none then results, the outlook is not hopeful, and there is strong probability that the muscles will remain permanently paralysed. The object of this manoeuvre is to relax the contracted and shortened muscles which are continually overcoming the efforts of the paralysed muscles to regain their former power, and at the same time to straighten out any slackness in the paralysed muscles, so that when they contract they will not require to take this in before the result of their effort is noticeable. The test is therefore, one of considerable delicacy, and permits the detection of the least degree of power.

METHODS OF TREATMENT.

Having considered the factors at work in bringing about these paralytic deformities, our attention can be directed to their prevention and treatment. The subject naturally divides itself under two

headings, namely, preventive treatment to anticipate the occurrence of a future deformity, and corrective treatment to improve, so far as possible, one which exists.

The means at our disposal can be classified as medical, surgical, or border-line measures. The last mentioned include those which can be carried out equally well by physician or surgeon, and mainly consist in the correction or prevention of deformity by means of simple forms of splints and appliances; it includes the most important measures we possess, and if correctly applied they will greatly diminish the number of deformities met with. Medical measures assist in hastening their object, whereas surgical treatment is only called for if the muscles are damaged beyond recovery. What I have to say has no bearing on the very early treatment, and it is generally agreed that at that stage active measures are more likely to do harm than good. We are considering the subject from the time when the paralysis has been present from two to four weeks and the muscles have lost their tenderness.

I will briefly indicate my own views. I have little faith in purely medical measures, very strong faith in their combination with simple mechanical supports, and believe that, were this more frequently carried out, the surgical operations now practised would be greatly diminished, many entirely disappearing, and only those remaining which have as their object the correction of damage directly due to the destruction of the ganglion cells. If these views are correct, and I shall try to prove that such is the case, the outlook is by no means so gloomy as it appears to be.

PREVENTIVE MEASURES.

Undoubtedly, if we accept the views as to their causation, preventable deformities should seldom if ever occur, provided treatment is conducted on lines planned to anticipate their occurrence. By this is meant that, as soon as the acute stage has passed off and a motor paralysis is established, the paralysed muscles should be identified and the limb retained in a position that will fully relax them. After this, but not sooner, a course of massage, electricity, muscle beating or other means of stimulating their vitality can be entered on. Retention of the parts in good position and the natural tendency to improvement at first will do much to produce a useful limb for the patient and a gratifying result for the practitioner, and even if ultimately some muscles are permanently damaged and the limb does not

retain its position on removal of the support, they are in the most favourable condition for an improving operation, as there are no shortened tendons, ligaments, or bony deformities to demand previous attention. No reference is made here to the shortening of bones and wasting of muscles which result from loss of trophic nervous influence. No practitioner, however zealous, can prevent them or be blamed for their occurrence; but what merits complaint are the apparently poor results at present obtained in preventing deformity when this lies in our power. That it occurs only too frequently will be realised by anyone who has worked in the out-patient department of a large children's hospital or in the orthopædic department of a general hospital. That the means of prevention have generally been inadequate can be gauged from the history we hear over and over again.

Illustrative Case.—For example, the mother tells us that the child had a sudden feverish attack while at play, and in a day or two weakness in the legs was noticed and it could not stand. A doctor was summoned, who, having relieved the fever, ordered a course of rubbing and bathing for the weakened limbs, with such good result that after some weeks the child was again able to walk and one leg completely recovered. The other, however, still remained weak, and the rubbing was continued, but the child was allowed to go about more or less as usual. Some months later the heel was noticed to be drawn up and not to be put to the ground when the child walked, and this gradually got worse, until advice was sought for the deformed foot.

This is only a hypothetical case, but it does not exaggerate, and represents very fairly what may be heard almost daily in our large hospitals. In criticising the case I believe the primary improvement and the cure of one leg were not due to massage and bathing, as the parent generally leads us to believe, but to the natural course of events. This opinion is based partly on the strong natural tendency to improvement at first, and partly on the fact that many other cases give an identical history, except that after the febrile stage had subsided no treatment was adopted and no medical man had ever been in attendance. Nature had done all that was in her power by the time that improvement ceased, and what is called residual paralysis remained. Through improper management, outside forces and, later, uneven muscular balance came into play and the present deformity appeared.

Importance of Position.—Every limb that is at first placed and retained in the most favourable position with the damaged muscles

relaxed will not necessarily produce a perfect result, but I firmly believe that if a spark of vitality remains in the damaged muscles attention to this point will restore to them an extraordinary amount of power, whereas if they are completely paralysed no treatment will restore their function, but no harm is done, and the carrying out of further measures is greatly facilitated.

A wider recognition of this principle by practitioners would certainly diminish the number of these deformities and entirely free us from the most aggravated forms. I admit the treatment presents many difficulties, and is tedious both to the medical attendant and the child's parents. It must be continued for a long period. Improvement only takes place slowly, and parents have an annoying way of tampering with splints and other apparatus. Still, this should not deter us from trying our best, and by prolonged observation and careful attention to good position we can do much towards the attainment of our object.

MEDICAL MEASURES.

Under the heading of medical measures I include the following:— Rest, the use of warm coverings, administration of strychnine, the employment of electricity and massage, and voluntary attempts on the part of the patient to contract the paralysed muscles. Medical treatment aims at keeping up the nutrition of the parts and assisting in the restoration of the damaged nerve elements. I shall discuss the methods of carrying out these measures and their varying merits, and then explain why I do not place sole reliance on them. Although each method is described separately, it must not be assumed that they are to be employed singly, but several can with advantage be tried, according as the circumstances demand.

Rest.—Rest naturally commends itself first, and it must be remembered that at the beginning the paralysis is generally more extensive and what remains is the residual paralysis. By rest it is meant that the patient should not be allowed to make use of the paralysed limb, except when he attempts voluntary movements under the direction of the physician. If the ganglion cells are not completely destroyed, rest gives them a chance of recovering from the shock.

Warmth.—The object of warmth is also obvious. Trophic changes are taking place in the paralysed part, and nutrition is impaired; the muscles waste rapidly, and the vasomotor disturbance makes the part colder than normal and it is pale or bluish

coloured. All paralysed limbs should be warmly covered, at first wrapped in cotton-wool or thick flannel, and later, when the patient goes about, a thick stocking or similar protection should be worn, but paralysed muscles should never be tightly compressed if they are to have a fair chance of recovery, and bandages should be avoided as they press on them too tightly and tend further to lessen the circulation.

Strychnine.—Of drugs, strychnine seems to have been most used. I have no experience of its use, as I am not in the habit of administering drugs to patients suffering from this disease, unless they are weakly or anæmic, when I find a little iron and cod-liver oil act beneficially on the system in general. Strychnine should not be commenced too early, as it increases the excitability of the cells of the anterior cornua. One month after the acute stage has subsided will be time enough, and for a child one year old half a minim of the liquor given by the mouth three times daily will be sufficient at first.

Methods of Stimulation.—Electricity, massage, and attempted voluntary movements have certain points in common, to which reference may be made before considering each separately. I have placed them in the order in which I value them, and have most regard for the last named. It is important that a careful examination of the paralysed part should be first made. An electrical examination is the most satisfactory, and best informs us which muscles should receive special treatment. It is usually advisable to confine the treatment to those most seriously damaged if they hold out any hope of recovery, and not to encourage too much power in the antagonistic groups. Another point is that it must be continued regularly either until some definite improvement takes place or it is certain that it will not be successful. Spasmodic treatment is useless, and has possibly brought about a certain amount of loss of faith; but a point of equal importance is that almost as much harm can be done by too great enthusiasm, since too prolonged stimulation only tires the damaged nerve and muscle fibres. About ten minutes daily, if carried out regularly, will usually suffice.

Electrical Treatment.—I have not had much personal experience of electrical treatment, and have only tried it in a few cases, but have come across many patients who have undergone courses. The following additional points have special reference to electrical treatment, and will be found useful when carrying it out :—

The part under treatment should be in a comfortable position,

with the weakened muscles relaxed, in order that they can easily respond to the stimuli. Children should not be frightened, and it is sometimes worth while accustoming them to the battery and electrodes for a few days before passing any current, and then commencing with it very weak. Once a child is frightened and has learned to fear the battery his crying and nervous upset will probably do more harm than the treatment good.

The electrodes and skin should always be well moistened, as this diminishes the resistance to the current. One of the electrodes is much larger and is known as the " indifferent," while the " active " is of smaller size. The indifferent is usually placed over the sternum or between the shoulders, and the active is applied to the motor point and other parts of the muscle ; in some cases both are on the muscle.

It is important to work with the weakest current that will cause a contraction, as this is all that is necessary, and avoids risk of exhaustion. The faradic current should be tried first, and if it causes contractions of the muscles, will suffice. If they do not respond to it, the galvanic current may show that the reactions of degeneration are present. Electrical treatment will do little good if neither form of current produces contractions, and it should be discontinued if this persists.

Massage.—I consider massage of more importance, because from a practical point of view it seems to have more scope and apparently yields just as good results. For the poorer classes electrical treatment practically means hospital attendance for a long period, and, if the patient is a child, somebody must accompany him, which may not be convenient if both parents and any elder children all go out to work. Massage requires no expensive or elaborate outfit, all that is necessary being a little inert powder and a moderate store of common sense, and most parents can be taught how, to what parts, and for how long, to apply the various movements. I do not imply that this will produce results as good as those obtained by a skilled masseur, but it is astonishing what success attends it. While the part is uncovered and under treatment care should be taken to prevent it getting cold, therefore it is preferable to do the rubbing near a fire. Gentle rubbing movements of the skin, always rubbing a limb in the direction of the trunk, should be first tried ; these increase the flow of blood in the part and improve nutrition. After two or three minutes attention should be specially directed to the paralysed muscles, which should be gently kneaded and lightly pinched between the fingers

and thumb for about ten minutes; this empties the veins, capillaries, and lymph spaces, making room for a fresh supply of nutriment. Care should be taken not to handle them too roughly or the weakened fibres will only be damaged and bruised.

Tubby and Jones [5] recommend the use of a muscle beater, which consists of a rubber ball fixed to a flexible steel rod in a handle. I have not tried this, nor any of the mechanical or electrical vibrators, but have no doubt they exert a beneficial action if used with care.

Voluntary Movements.—I place most reliance on attempts at voluntary movements, as each time an attempt is made and the will called into action a nervous impulse is sent to the site of lesion and excites the functional activity of the nerve cells. At first they should be carried out under the supervision of the medical attendant, and only for about ten minutes daily to prevent over-exertion. They will prove beneficial, even though no contraction of the muscles is apparent, as the impulses are nevertheless transmitted and stimulate restoration of function in any cells which are not completely destroyed. Resistance exercises are also useful, the patient throwing the weakened muscles into action while the observer offers gentle resistance to the limb with his hand. When improvement is established and the muscles are regaining power, these movements can be replaced by exercises for a few minutes every morning and evening. They vary widely, according to the requirements of each individual case, but are planned so as to strengthen the weak muscles. For example, if the invertors of the foot are weak, walking on the outer borders of the feet should be practised, while in weakness of the calf muscles tip-toe exercises are indicated. As soon as fatigue is felt they should be stopped, as further perseverance only does harm.

Where Medical Measures Fail.—Having described the various medical measures at our disposal, I shall now point out why I do not place sole reliance in them; they all seem well planned with excellent objects in view, and any want of confidence may therefore seem strange. We must look back for a minute to the causation of the deformities. I described how they were first induced either by the force of gravity or body pressure, and later unequal muscular balance came into play. The outcome was that the stronger muscles remained contracted and shortened while the weaker were continually overstretched and placed at a mechanical disadvantage. A weakened and overstretched muscle, even although it retains some power, is quite unable to resist the

constant pull in the opposite direction, and therefore stretches and gives way further, and is to all intents and purposes paralysed, but if it is relaxed and kept so, the muscle fibres have a chance of regaining their power, and when they contract there is no longer a strong opposite pull to be overcome; contractions bring about increased blood-supply and improved nutrition of the muscle fibres.   I also mentioned that there were frequently a number of sound muscle fibres in a degenerated muscle, and these play a very important part, as they hypertrophy and try to replace those which are permanently damaged.   These facts perfectly explain why muscles which have apparently been powerless for years seem to regain most of their former power once they are relaxed and placed in a mechanically advantageous position. It is on these facts that I base my want of complete reliance in medical measures, which all seem very useful adjuncts, but to my mind miss the essential point in the treatment, namely, to keep the weakened muscles relaxed.   A patient who receives a course of massage or electricity daily no doubt derives great benefit from the actual stimulation, but unless the weakened muscles are afterwards retained in a suitable position, gravity or body pressure rapidly undoes any good so gained, by stretching them and preventing them from retaining their power, so that when the treatment comes to an end they are not strong enough to look after themselves, and deformity results.

MECHANICAL MEASURES.

The ideal way, therefore, of preventing deformity is to anticipate it, and to retain the weakened muscles in a relaxed position, and this will be equally serviceable when an early deformity is present.   It interferes in no way with the carrying out of medical treatment, because the muscles are in the best possible position to derive benefit from it.   It may be asked, at what period after the paralysis should splints be applied?   The answer is, as soon as the paralysed muscles have been identified, and this is very important, as the part should be retained in a slightly over-corrected position, which can only be estimated by realising their action.   If all the muscles acting on a joint are paralysed, it is best retained in the position in which it will be most useful should it be necessary to fix the joint at a later period, but at present we are considering those cases in which there is hope of some recovery.

Characters of a Good Splint.—Splints are made of a large number of materials, but there are certain points which should

be present in every good splint—it should be light and simply constructed. A patient who has to wear a splint for any length of time will appreciate one which does not act like an anchor. Simple construction is important, and screws and nuts are liable to work loose and get lost, and are unnecessary. A good splint should also fit comfortably in the position in which the part is to be retained, and should, therefore, be made of some substance which can be moulded to it easily. Two additional points of especial importance for poorer patients are that it should be inexpensive and composed of some substance which is easily cleaned.

I shall only describe those splints and other mechanical appliances of which I have personal experience.

Strapping.—The simplest form of retention apparatus is a strip of adhesive strapping applied in such a way as to exert an opposite pull to the antagonistic muscles. This answers well in some mild cases, but I do not rely on it much, as I think the strapping is apt to slip, and parents often reapply it in an ineffective manner.

Sling Halter.—Another simple appliance is a sling halter for keeping the elbow flexed slightly further than the right angle to relax a paralysed biceps muscle (Fig. 6). It consists of two pieces of leather to encircle the wrist and neck, with a connecting strip of suitable length between.

Malleable Iron Splints.—Of the splints proper I think that those composed of thin malleable iron are the most useful, as they can be bent by hand to fit almost any required part, and are amply strong enough to retain it in the desired position. They should be kept in various widths, and should be slightly concavo-convex from side to side.

Club-Foot Shoe.—The club-foot shoe is a useful modified form of iron splint. It consists of two plates made to fit the sole of the foot and the lower half of the calf of the leg, these being united by a strip of unyielding iron bent in such a way as not to press on the heel or the tendo Achilles, and to keep the foot at a right angle when the sole and calf are in contact with their respective plates.

Poroplastic.—Poroplastic makes very useful splinting, and when heated can easily be moulded to the part.

Celloidin.—I have lately seen celloidin splints in use in Edinburgh, and they appear to have several advantages, being light, cheap, and effective, the only drawback being that they are

rather troublesome to make (Fig. 1). A cast is first taken of the part in the over-corrected position, and then a number of open texture bandages thoroughly soaked in celloidin are bandaged over the cast. Six or more layers are required, and in some long splints for the whole leg it may be necessary to incorporate in the bandaging two or three strips of iron to give additional strength. The celloidin requires two or three days to set, and the splint is then cut off the cast and finished off.

Poroplastic and celloidin splints can be used as supports for walking. They can be lined with thick lint, covered outside with mackintosh material, and have little hooks fixed on so that they can be laced like gaiters.

Modified Boots.—The simplest forms of mechanical appliance to aid walking are alterations in the boots whereby the body weight is deflected to one or other side to take the strain off the weakened muscles. Thus in talipes varus an additional wedge of leather about half an inch thick is placed along the outer edge of the sole and heel of the boot, so that the foot tends to be tilted outwards and the weight is transferred to the inner side, relaxing the peronei muscles. In talipes valgus the opposite holds, and the inner borders of the sole and heel are raised to keep the weight of the body on the outer border of the foot. In talipes equinus the heel is nearly or entirely removed and, if necessary, the sole increased in thickness to overcome the tendency of the tendo Achilles to contract.

Irons.—In severer cases a further modification can be carried out by adding a supporting iron for the ankle. One end terminates in a padded steel calf band, which is strapped round the upper part of the calf, while the lower end is turned in to fit into a slot in the heel of the boot. It can be bent to various positions by means of strong pliers.

In addition to the alterations in the boots an external iron would be used in talipes valgus and an internal iron in varus, the ankle being drawn close to it by a strap passing round the top of the boot. When the iron fits into either side of the heel flexion and extension of the ankle are permitted, but in talipes equinus or calcaneus the iron is posterior, and prevents these movements.

Thomas's Caliper.—Thomas's caliper splint is a most useful apparatus in all cases of extensive paralysis of the muscles of the leg, especially of those controlling the knee and hip joints. It consists of a ring of round iron, roughly oval in shape, being flatter in front and the narrower end to the outer side. When

in position it rests in such a way that its lowest point acts as a support for the tuberosity of the ischium and the outer part rests at a higher level on the outer side of the thigh. It is so padded with boiler felting that it is twice as thick at the inner and posterior portion which supports the tuberosity of the ischium, and it is finally covered with leather. From this ring two iron bars pass down the inner and outer sides of the leg, the inner being welded on to the ring a little in advance of the outer, and they terminate by turning in to fit into slots on each side of the heel of the boot; the side bars are not parallel to one another, but follow the outline of the leg and converge on the heel.

The splint is applied by slipping the foot through the ring, which is pushed up until it presses firmly against the tuberosity of the ischium; the lower ends of the side bars should then be exactly opposite the slots in the heel into which they are fitted. The leg can be fixed by straps or bandages to one or both bars, and can thus be drawn straight if there is any deviation at the knee; the side bars are usually rigid, but a joint can be placed opposite the knee. This walking caliper is invaluable in cases of weak and flail legs, and has permitted many to walk who would not have been benefited by an operation.

Plaster of Paris.—I do not include plaster of Paris in this list, as it is heavy and does not allow access to the muscles for massage and other treatment; it is far more serviceable in cases in which it is necessary after an operation to keep a joint absolutely immobile for some time.

Rules for the Use of Appliance.—When applying a splint, the part should be kept in a slightly over-corrected position, and a slight deformity in the opposite direction produced; this insures that the weakened muscles are completely relaxed and leaves a small margin to counteract the tendency to recurrence. Care should be taken to avoid tight bandages, which press on the muscles and interfere with nutrition. Often a splint can be retained in position with two or three strips of adhesive strapping, and if it is applied to the stronger side of the limb the weakened muscles are easily accessible for treatment (Fig. 3).

The earlier splints are applied, the better the result. In the upper extremity the splint or apparatus should be worn continuously until there is either evidence that no further improvement will take place, or the muscles answer to the test of recovery. In the lower extremity the splint should be worn constantly at first, but as soon as the muscles get a little stronger the patient should

FIG. 1.
Collodin Gaiter.

FIG. 2.
Paralytic Wrist Drop.

FIG. 3.
Mechanical Treatment of Paralytic Wrist Drop.

FIG. 4.
Patient with two Thomas Calipers.

Fig. 5.

Poliomyelitis of Upper Extremity.

Fig. 6.

Mechanical Treatment of Poliomyelitis of
Upper Extremity.

Fig. 7.

be encouraged to do some walking, as it improves their nutrition and does no harm if precautions are taken to prevent their being overcome by body pressure. In mild cases of talipes an alteration in the boot may be all that is required, while in severer cases the addition of an iron may be necessary. A splint of some sort must always be worn at night until recovery takes place.

Test of Recovery of Muscles.—The test of recovery of paralysed muscles is that they are able to retain the part in the over-corrected position when the support is removed. After wrist-drop the hand is retained in the hyperextended position, and after biceps paralysis the hand can be moved to a position near the mouth from its position with the elbow flexed slightly more than a right angle. When the test of recovery appears, it is a great mistake at once to leave off all apparatus and allow the muscles their full range of movement, as this will assuredly overstretch the newly-recovered fibres. Full relaxation must be reached gradually, allowing the muscles a little wider range of movement every few days, and carefully watching that they never lose their power of full contraction.

Safety of Operating on Paralysed Limbs.—Before considering the surgical treatment, I should like to allude to one other point. Some may with perfect justice question the wisdom and safety of incising these paralysed limbs and performing delicate surgical operations which depend on perfect asepsis for their success. Suppuration after a tendon transplantation operation would certainly spoil any success which was expected to result from it. It can only be answered that clinical results prove that there is no fear whatever of sepsis, but, on the contrary, the wounds heal quickly and almost invariably aseptically. This is certainly unexpected in a part, the nutrition of which is very much below normal, and I do not know why it should be so, but it is of inestimable assistance when surgical measures have to be carried out in bad cases.

(To be continued.)

THE ABSENCE OF CERTAIN MITRAL MURMURS IN MITRAL DISEASE.*

By W. T. RITCHIE, M.D., F.R.C.P.,
Assistant-Physician, Royal Infirmary.

RECENT researches on the contractions of the auricles have indicated that certain murmurs of mitral origin may become inaudible when the auricular musculature is in fibrillation, or when the auricles contract synchronously with the ventricles.

I. *Mitral Systolic Murmur.*—A change in the character of a mitral systolic murmur, or its abolition, owing to synchronous contraction of auricle and ventricle, are events of not infrequent occurrence. John Cowan,[1] in a paper with the writer, was the first to direct attention to such changes in the character of a mitral systolic murmur as a necessary result of the varying incidence of auricular and ventricular beats in partial heart-block. In the case discussed on p. 78 of our paper the mitral systolic murmur was a short soft whiff, when the ventricles contracted "immediately before the succeeding auricular contraction, and at a time when the auricles were already so full that regurgitation from ventricle to auricle could only be minimal, however great the mitral incompetence." The murmur, however, was longer and louder when "ventricular contraction occurred relatively early in relation to the succeeding auricular systole, and at a time when, the auricle being not yet nearly full, a maximal regurgitation was possible."

More recently, in other cases of mitral incompetence in which extrasystoles occurred, I have noted that whenever the ventricular and auricular systoles coincided the mitral systolic murmur was inaudible. This auscultatory phenomenon was most strikingly notable in a case of coupled ventricular rhythm due to regularly recurring ventricular extrasystoles. The auricular rhythm was not disturbed, and each ventricular extrasystole occurred at a time when the auricles were in contraction. Each physiological beat of the ventricles was preceded by an auricular contraction, was accompanied by a loud blowing murmur of mitral origin, and was followed by a closed second sound. The extrasystole likewise occasioned two sounds, but both were clear and unaccompanied by any murmur. No murmur accompanied the ventricular extrasystole, because, the latter occurring at a time when the auricles were in contraction, regurgitation through the incompetent mitral valve could not occur, or could only be minimal.

A further contribution to the auscultatory phenomena dependent on changing rhythm of auricle and ventricle was that made by Wardrop Griffith.[2] Discussing two cases of heart-block, he draws attention, in the first case, to the fact that the first sound of the heart varied markedly, being sometimes almost entirely replaced by a systolic bruit, and at others being singularly thumping in character and quite unaccompanied by any bruit. In the second case, whenever the auricle and ventricle began their contractions about the same time, the first sound as heard at the apex was "singularly thumping and emphatic in character, reminding one rather of the loud first sound which one gets in cases of mitral stenosis but duller than this." A similar first sound heard at the apex in a patient with mitral stenosis and in whom the auricles contracted while the ventricles were still in systole is recorded below.

II. *Mitral Presystolic Murmur.*—Some recent writers, notably Brockbank[3] and Pezzi,[4] still regard the mitral presystolic murmur as of ventriculo-systolic origin, while others such as Stuart Hart[5] and Macdonald Gill[6] consider that the murmur may occur even when the auricular musculature is not in co-ordinate contraction. The murmur, however, is now almost uniformly admitted to be auriculo-systolic in time and origin, as was demonstrated by Gairdner[7] in his classical paper. When the co-ordinate contraction of the auricular musculature, antecedent to ventricular systole, is replaced by fibrillar contraction, a pre-existing mitral presystolic murmur disappears, as was first pointed out by Mackenzie.[8] In many cases of mitral stenosis, however, a mitral diastolic murmur is audible even when the auricles are in fibrillation; and if the ventricular rate be rapid and ventricular diastole very short, this murmur may continue until the succeeding first sound, and may then be mistaken for a genuine auriculo-systolic murmur. Mackenzie has pointed out that if in such a case ventricular diastole be prolonged, the obstructive murmur may cease before the first sound. In several cases of mitral stenosis with fibrillating auricles and rapidly acting ventricles I have found that this auscultatory phenomenon can be elicited remarkably clearly when the short ventricular diastole becomes prolonged under the influence of digital pressure on the right vagus.

Granting that the mitral presystolic murmur disappears when the auricles are in fibrillation, it does not follow that the absence of this murmur in mitral stenosis necessarily indicates auricular fibrillation. In some instances, when the ventricles are beating rhythmically, and when the auricles are therefore presumably not

in fibrillation, we find certain physical signs of mitral stenosis, more particularly a snapping first sound at the apex of the heart, with a markedly accentuated and reduplicated second sound at the pulmonary area, and yet no presystolic murmur. The absence of the murmur is doubtless due to various causes. Thus in some instances, as ascertained by Gibson,[9] the presystolic murmur may be absent even although the auricular deflection *P* is present in normal situation in the electrocardiogram. In other instances, however, a satisfactory explanation, to which attention has not been directed so far as I am aware, is the onset of auricular systole before the antecedent ventricular systole has ended. This disturbance of the heart's action is now well recognised, and is of not infrequent occurrence.
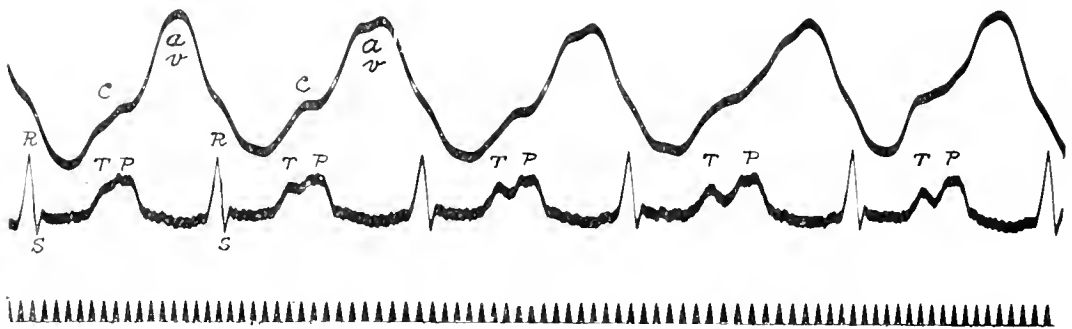
FIG. 1.

Jugulo-carotid pulsations and electrocardiogram recorded by derivation II. from a case of mitral stenosis without presystolic murmur. The tension of the string was adjusted so that, with a magnification of 450 diameters, a difference of potential of 1 millivolt introduced into the circuit containing the galvanometer and patient, or resistance box, gave a deflection of 1 cm. The time record is 28·57 per second.

Fig. 1, showing a simultaneous record of the jugulo-carotid pulsations in the neck and of the electrocardiogram obtained by derivation II. (right hand and left foot), illustrates the time-relation of the auricular to the ventricular beats in a case of mitral stenosis without a presystolic murmur. The patient was a miner, aged 30 years, who came to the Medical Out-patient Department of the Royal Infirmary, complaining of weakness of the legs and shortness of breath of four years' duration. He stated that he had never suffered from rheumatism, syphilis, or dropsy. As ascertained by percussion, the heart was of normal size. At the apex both sounds were closed, while the first had a markedly snapping character. During the initial phase of the long pause there was a short, faint, ill-defined murmur, which was not of crescendo character and did not lead up to the succeeding first sound. The second sound at the pulmonary area was markedly accentuated and reduplicated. The walls of the brachial and radial arteries were palpably thickened.

The maximum systolic arterial pressure was equal to 155, and the diastolic pressure to 115 mm. Hg.   The lungs, abdomen, and urine presented no abnormality.

In Fig. 1 the heart is beating rhythmically at a rate of 102 per minute.   In the electrocardiogram the ventricular deflections *R, S,* and *T* are seen clearly, but *T* is deformed by the *P* of the succeeding cycle being superposed on it.   The time-relation of the onset of *P* to the deflection *T* is somewhat inconstant, for *P* starts successively later in the first four cycles.   In subsequent portions of the record, however, the relation of the onset of *P* to *T* remained the same as at the end of Fig. 1.

The duration of the *P-R* intervals is greatly lengthened, measuring successively 0·28, 0·29, 0·29, 0·31, 0·31 second, which is about twice the duration of a normal *P-R* interval.   It is therefore evident that the conduction of stimuli along the auriculo-ventricular bundle system is taking place at about one-half the normal rate.   Owing to the delay in the conduction of stimuli to the ventricles and the consequent delayed onset of ventricular systole the latter has not yet terminated when the succeeding auricular contraction starts.   The record of the jugulo-carotid pulsations also reveals the same disturbance of the heart's mechanism, for while the carotid wave, *c*, is distinct, it is quickly followed by a larger wave representing the *a* and *v* waves fused in one.

In this case of mitral stenosis the presystolic murmur is inaudible, because, owing to defective conductivity, each auricular systole does not evoke a ventricular response until such an interval has elapsed that the auricles are again in systole.   In this respect the case resembles most closely that recorded by Wardrop Griffith and Cohn.[10]   The synchronous contraction of auricle and ventricle prevents the former driving its contained blood onwards through the stenosed mitral orifice into the ventricle.

When conductivity is unimpaired, synchronous contraction of auricle and ventricle may result if both the auricular and the ventricular rates are uniformly accelerated in marked degree. Wenckebach[11] considers that the "critical frequency"—with synchronous contraction of auricle and ventricle—is attained when the heart's rate rises to 180 per minute.   If this condition prevails in a case of mitral stenosis, it is evident that no auriculo-systolic mitral murmur will be audible.

Summary.— If, either from impaired conductivity or cardiac acceleration, the auricles contract while the ventricles are still in systole, the former will be unable to drive their contained blood

onwards into the ventricles ; and if there be mitral stenosis, there can be no genuine auriculo-systolic murmur during the last phase of ventricular diastole. In such instances the only obstructive murmur of mitral origin will be an early diastolic murmur.

References.—[1] Cowan and Ritchie, *Quart. Journ. Med.*, 1910-11, iv. 55. [2] Wardrop Griffith, *Heart*, 1911-12, iii. 143. [3] Brockbank, *Brit. Med. Journ.*, 1909, ii. 509 : *Quart. Journ. Med.*, 1909-10, iii. 345. [4] Pezzi, *Policlinico*, 1910, xvii. M. 445. [5] Hart, *New York Med. Record*, 1911, lxxx. 2. [6] Gill, *Austral. Med. Gaz.*, 1911, xxx. 1. [7] Gairdner, *Edin. Hosp. Rep.*, 1893, i. 221. [8] Mackenzie, *Quart. Journ. Med.*, 1907-8, i. 39. [9] Gibson, *Life of Sir William Tennant Gairdner*, Glasgow, 1912, 683. [10] Wardrop Griffith and Cohn, *Quart. Journ. Med.*, 1909-10, iii. 126. [11] Wenckebach, *Deutsch. Arch. f. klin. Med.*, 1910, ci. 402.

MULTIPLE MYELOMA.

By THEODORE SHENNAN, M.D., F.R.C.S.,

Pathologist, Edinburgh Royal Infirmary.

II.

Before proceeding further it may be of advantage to describe three cases which recently came under my notice, and which possessed characters which seemed to justify their inclusion within the group of multiple myelomata.

Case I.—For the clinical notes of the first case I am indebted to Dr. Lovell Gulland, Edinburgh.

W. M‘K., a male, 57 years of age, was admitted to the Chalmers Hospital, Edinburgh, towards the end of July 1912. He had been ill and unable to work for several months, complaining of pain in the back, shooting down the backs of both thighs, and of weakness of the lower limbs. He had been under treatment for lumbago and Bright's disease.

On admission he was somewhat emaciated, and stated that he had lost some weight. He was able to walk only with difficulty, and was unable to move about in bed with any freedom. He was able, however, to sit up in bed, to lean forwards, and touch his toes with the arms extended. He had no marked rigidity of the spine, and no tenderness over the spine or along the lines of the sciatic nerves. Examination of the chest and abdomen was negative. Examination of the nervous system showed only exaggeration of the knee-jerks : ankle-clonus, and weakness of the leg muscles : no Babinski : no sensory changes : no optic neuritis. The urine contained a very large amount of albumin, and some Bence Jones' albumose, but no blood. The blood showed nothing abnormal : the colour index was not low. X-ray photographs of the back demonstrated the presence of disease of the bodies of several of the lower vertebræ.

He remained in hospital for about a month. One evening he developed acute dyspnœa, and the left side of the chest was found to be dull almost to the apex. A large quantity of fluid was aspirated. The centrifugate contained a few red blood corpuscles, but no other cells.

He was transferred to the Longmore Hospital for Incurables, the diagnosis being malignant disease of the lumbar vertebræ—presumably myeloid sarcoma—with secondary deposit in the pleura.

He died on 18th October, and next day a post-mortem examination was conducted by Dr. Harvey Pirie, from whose notes the following extracts are made :—

Emaciation extreme. Nodules of hæmorrhagic new growth in the ribs of the right side, in right clavicle, and to a lesser extent in the ribs of the left side. Adhesions throughout right pleural cavity : fluid in left pleura. Red fleshy growths infiltrating adhesions on right side. Lungs, no important alteration. Liver shows one or two small nodules, white with hæmorrhagic mottlings. Kidneys, subacute parenchymatous nephritis. Spleen large and soft. Spine, a large projection at level of three lowest dorsal vertebral bodies, and others of smaller size on right side of 3rd to 6th dorsal bodies. Bodies of all vertebræ, from 1st sacral to 7th cervical, infiltrated with new growth, and easily divided with the knife. On section several of the vertebral bodies contain rounded brownish-red, soft, circumscribed masses of almost homogeneous appearance, varying in size up to nearly an inch in diameter. Within these areas the spongy bone has completely disappeared. Where some of these impinge upon the cortical layer of bone this has disappeared, and rounded projections of the new growth appear on the surface. There is also diffuse infiltration in all the bodies, with a varying degree of osteoporosis.

From the naked-eye appearances a diagnosis was made of multiple sarcoma of the vertebræ, probably starting in the lower dorsal region.

Histological Examination.—Portions of the new growths were fixed in Pick's fluid and in corrosive sublimate, and paraffin sections were stained with hæmalum and eosin, iron hæmatoxylin and picro-fuchsin, thionin blue, Löffler's methylene blue, Borrel's ripened methylene blue, alcoholic eosin and methylene blue, Ehrlich's triacid stain, and by Schridde's azur-eosin-acetone method for demonstration of granules, Leishman's stain, etc. The appearances, especially of the nuclei, vary slightly with the staining method employed.

In some of the masses the nucleated cells are separated up by numerous diffusely scattered red blood corpuscles, but in others the hæmorrhages are not so evident. The nucleated cells practically all belong to one type of cell. This is a rounded cell—or polygonal from mutual compression—on an average about twice the diameter of a

red blood corpuscle, the size of individual cells varying from a little larger than the red blood corpuscle to nearly three times that size. The nucleus, rounded or slightly oval, is excentric in the majority of instances. With the hæmatein stains the chromatin seems at first sight to be almost homogeneous, but on careful decolorisation, and if a high magnification be used, it is seen to be made up of minute clumps arranged as a rule somewhat irregularly. In many cells it forms a ring against the nuclear membrane, with several largish granules within the nucleus. Many nuclei show evidence of degenerative changes. When stained with Borrel's blue the chromatin in many of the nuclei shows an arrangement somewhat like that characterising the "plasma cell." The chromatin network is closer in the smaller (younger?) cells than in the larger (older?). Some of the larger cells contain two and three rounded nuclei. The cytoplasm is plentiful as a rule, is basophilic with methylene blue, and frequently condensed at the periphery of the cell. Occasionally small vacuoles are to be made out; there is no distinct cell wall. Large giant cells with the characters of myeloplaxes are to be seen in small numbers, and also a few eosinophil cells; no undoubted nucleated reds. The interstitial fibrous tissue is very scanty, and thin-walled blood-vessels are present in considerable numbers. These contain a few cells corresponding in appearance to the predominant cells of the new-growth.

The nodules in the liver are composed of apparently similar cells.

Hence the appearance of the cells predominating in the new growths, when stained with Borrel's blue and other basic anilin dyes, corresponds to that of the bone-marrow plasma cell of Wright, Christian, and others. But with other staining methods the cells resemble very closely the myeloblasts and myelocytes, especially the former, of the surrounding bone marrow. It is evident that the pathological myeloblast cannot be clearly differentiated from the bone-marrow plasma cell, and to my mind it is an open question whether they are in reality different cells. This case might, in consequence, be placed either with the plasmacytic or with the myeloblastic myeloma, the decision depending to a great extent upon the methods employed in preparing the microscopic sections.

CASE II.—The second case occurred in the practice of Dr. Ewing of East Ardsley, Wakefield, whom I have to thank for the excellent notes of the course of the illness, and for the description of the post-mortem examination, in which he was assisted by Drs. Watson and Stewart.

The patient, a man, 51 years of age, had been known to Dr. Ewing

for some 12 or 13 years as a perfectly healthy man. There was no history of old syphilitic infection, and there was no evidence leading one to suspect it.

On 21st February 1911, when at work in a rather cramped position, engaged in screwing up a nut on a locomotive engine with the aid of a large spanner, he slipped and violently strained the lower part of his spine. Severe and immediate pain was experienced, which was put down to rupture of some part of the erector spinæ muscle. The pain was intense in the right lower costal region, close to the spine, and it continued of this severe character up to the middle of April. Owing to the occurrence of slight rises of temperature it was thought that rheumatism might be complicating the condition, but the ordinary remedies afforded no relief. Large quantities of morphia were administered by his medical attendant, with only temporary relief. On 18th April he was examined for malignant disease on account of hæmorrhage from the bowel, with continuous pain, general over all the bones, varying in degree, accompanied by some wasting and marked depression, but nothing definite could be determined. Towards the end of the month a little improvement set in, and he was enabled to go out of doors. Soon the pains returned—1st May—and marked wasting set in, with occasional rigors. Malignant disease of the spine or right kidney was suspected. During May, June, and July 1911 the pain was continuous and intense. Some evidence of tuberculosis was found at the right apex. On 11th August the spine in the dorsal region became tender, and the spinous processes prominent. The patient was thenceforwards confined to bed. During the remaining months of 1911 the pain continued very severe in the region first attacked, and also all along the spine, with enlargement and marked deformity of the upper dorsal and cervical vertebræ. Spinal caries was suspected. The left hip-joint became enlarged and tender. He was now thought to be suffering from generalised tuberculosis. In January 1912 deformity of the left hip was noticed. This was shown at the post-mortem examination to have been due to spontaneous fracture. From February to November 1912 he suffered from severe pain in the head, neck, back, and in the upper and lower extremities; he was profoundly emaciated; almost all the joints were stiff and swollen. Death took place on 3rd November.

During life the urine was examined repeatedly. It was always transparent. It contained no albumin at any time; it was not tested for albumose.

A post-mortem examination was conducted on 5th November. The brain and the abdominal organs were found to be normal, and there were no evident changes in the cranial bones. Thorax—the thoracic cage was markedly distorted. There was marked pericarditis, old

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pleuritic adhesions, slight evidence of tuberculosis at both apices, but no secondary nodules in the lungs or in any of the organs.

There was marked deformity, with shortening of the thigh to the extent of $2\frac{1}{2}$ to 3 inches. This had been caused by a partly united fracture at the upper end of the femur, about the level of the lesser trochanter. The head and neighbouring part of the shaft were diseased internally. There was lateral curvature of the lower dorsal spine, curvature forwards of the cervical and upper dorsal spine. The bodies of the vertebræ were diseased, the spongy bone being replaced by reddish-brown, soft, sarcomatous-looking masses. Similar changes were found in the ribs and sternum, but there were no prominences on the exterior of any of these bones, and no localised swellings of the ribs. The kidneys were apparently healthy. Dr. Stewart examined the new growth microscopically, and reported it to be a multiple myeloma.

Dr. Ewing adds the following remarks with regard to the causal relationship of the injury sustained to the disease :—

"That C. met with an accident which injured some of the structures of the spinal column I think there is not any doubt. His story of the accident was perfectly consistent with the condition found when he was examined first. The persistent localised pain was a marked feature in the course of his disease, and must of necessity have originated on the night of 21st February 1911, as proved by his total helplessness from that moment. His general health to all intents and purposes up to then had not suffered. The bodies of the vertebræ apparently proved to be the primary site of the disease."

Examination of microscopical sections stained with hæmalum and eosin shows that the new growth is made up of closely-packed, rounded, or polygonal cells, each with darkly-staining nucleus and a considerable amount of protoplasm, the proportion of which varies in different cells. The interstitial substance is very scanty, but numerous thin-walled blood-vessels ramify amongst the cells. On staining with Borrel's blue and alcoholic eosin the nuclei as a rule stain faintly, the chromatin being in somewhat fine granules and arranged in a peripheral ring, and in small clumps throughout the nucleus. The cytoplasm is distinctly granular, so that one gains the impression that these cells are more closely allied to the myelocytes than are the cells of the other cases examined. I have not had the opportunity of investigating the case histologically to an extent sufficient to enable me to dogmatise on this point.

Provisionally, however, the case may be placed with the myelocytic myelomata.

CASE III.—I had hoped to be able to give full details of this case, an adult male native, under the care of Dr. J. R. Morris,

Bhandara, Central Provinces, India, but I regret that these are not yet to hand, and as I have only the histological evidence to go upon, my reference to the case cannot be anything but meagre and incomplete.

The tissue sent me for examination in September 1912 had been removed from a new growth in the upper end of the humerus. A diagnosis of round-celled sarcoma was made as a result of a former microscopical examination, but on clinical grounds Dr. Morris doubted if this was correct.

On employing methods similar to those used in my first case, the general characters of the cells composing the new growth correspond very closely to those already described in connection with that case, and that description might be again adopted here, with a few modifications. There is a greater number of large cells with two, three, and even four rounded nuclei, all possessing the same characters as those of the mononucleated cells. The chromatin is, as a rule, in a little finer granules, and oftener arranged in a ring against the nuclear membrane, but also scattered throughout the nucleus, in which a nucleolus is easily made out. The cytoplasm is plentiful and finely granular, but not in the sense of Ehrlich-granulation, while with methylene blue it is distinctly basophilic. Many of the smaller-sized cells possess more densely staining nuclei, thus resembling closely the lymphocyte. A considerable number of myeloplaxes were seen.

So far as can be made out, this case may be classed along with the first case.

Discussion.—In discussing a complex subject like myeloma, round about which such a number of apparently discordant views have sprung up, and in connection with which there is in consequence not a little confusion of ideas and judgment, it is essential, in my opinion, to start out from the generally accepted *dictum* that a true myeloma must be a homologous new formation (*qua* the bone-marrow), that is, it originates from bone-marrow parenchyma. It cannot be regarded altogether as a hyperplasia of the marrow, seeing that as a rule only one type of cell is affected, to the exclusion of and displacement of other types of cells normally found in active or reacting bone-marrow. Giant cells with convoluted nuclei (myeloplaxes) are not common, though Börst regards these as distinctive. They were present in small numbers in my first and third cases. Similarly, fully matured cells — the polymorphonuclear series — are awanting, excepting occasional eosinophils, so that a further distinction emerges, namely, that the constituent cells are mainly or wholly *unripe* cells. The above definition excludes also cells such as

osteoclasts, osteoblasts, and other cells constituting or formed from the so-called endosteum.

In reading the numerous papers on myeloma one must bear in mind that in many of the cases the tissues have not been fixed in a manner suitable to the demonstration of Ehrlich-granulation in the cells, so that under more favourable conditions some of the cases designated myeloblastic or lymphocytic might possibly have been included within the myelocytic group.

In scarcely any case has the oxydase reaction been applied to the fresh tissue, or to tissues recently fixed in formalin. Schültze (1909) states that this reaction, or iodophenyl-blue synthesis, develops exclusively in the granular cells of the bone-marrow series—myelocytes, leucocytes, and mast cells. The cells of the lymphocyte series remain unstained. In a later communication (1910) he states that the granules in the cells of the salivary and lacrymal glands also show the reaction. Nakano gives the latest information with regard to this reaction.

The Myelocytic and Myeloblastic Myelomata.—One may accept it as proved that the great majority of multiple myelomata are composed of cells which correspond either to the myelocyte—as in Sternberg's case, and probably also in my second case—or more commonly to its precursor, the myeloblast or pre-myelocyte. The latter cell in every respect save the neutrophil granulation resembles closely the myelocyte, but it certainly represents an earlier stage of development. It is recognised that the myeloblast attains to adult size before the granules appear in its cytoplasm (MacCallum). Hence one should expect to find in some myelomas intermediate forms, that is, cells possessing a few granules, and such have been actually reported. Granting that the cells are immature, one should also expect a variation in the size of the myeloblast, so that in some cases smaller cells with a smaller proportion of cytoplasm predominate, whereas in other cases the average size of the cells is greater. Further, immature cells being prone to undergo degenerative changes, some of them may display condensation of the nuclear chromatin with homogeneous deep staining (pyknosis), while in neighbouring cells the nuclei may be vesicular, or the chromatin may be broken up into coarser or finer granules (karyorrhexis), whereas the majority of the cells have the normal appearance already described. Hence, on account of this apparent dissimilarity of the cells, the new growth may be described as composed of several types of cells. It is consequently possible that some of the cases described as lymphocytoma and

plasmacytoma should be included in the myeloblast group, the histological diagnosis depending in great measure on the method of staining employed.

Great difficulty is experienced when we attempt to determine the exact nature and correct position in the classification of the cases which have been described as lymphocytoma and plasmacytoma.

The *lymphocytoma* is composed of cells resembling the ordinary lymphocyte, but possessing a greater proportion of cytoplasm, so that they correspond rather to the large lymphocyte, an earlier stage of development. The large lymphocyte is with difficulty distinguishable from the myeloblast. The lymphocytoma is stated to originate from the lymphocyte-forming tissue of the bone-marrow, and the new formation takes place without involvement of the lymphocyte-forming centres in the lymphatic glands and of other lymphadenoid foci scattered throughout the body. If this be really so, we have to accept the bone-marrow origin of the lymphocytes of the blood-stream, and to distinguish these from the so-called histogenic lymphocytes of the tissues. The former class should alone be affected in the lymphocytic myelomata, and, reasoning on these lines, many authors approximate the lymphocytoma to the conditions termed in German literature *medullary pseudo-leukæmia*, the term indicating that the cells do not overflow into the blood-stream. I have never, however, been able to accept this distinction between the members of the lymphocyte class as an absolute one, seeing that the blood lymphocytes are amœboid, and their ability to emigrate from the blood-vessels has been demonstrated. One cannot assert, therefore, that the tissue lymphocytes have not originally emigrated from the blood, an opinion which is held by many competent workers. Further, the explanation referred to does not account for the lack of reaction in the lymphocyte-forming centres in the lymphatic glands.

Thus if we admit that certain myelomata are formed of cells of the lymphocyte class, and require them to conform to the definition of myeloma as a homologous development of bone-marrow elements, we open up the whole question of the monophyletic or polyphyletic origin of the blood corpuscles (C. Hart), that is, the derivation of the granular and non-granular cells, including the red blood corpuscles, from one ancestral cell or from different ancestors; and until the supporters of these two doctrines settle their differences, the question cannot be solved. Further, the suitability of the term "myeloma" as connoting all the different new formations included under it remains in doubt.

If it be finally proved that the lymphocyte of the blood actually originates in and proliferates in the marrow, as distinct from endosteum—and Hart points out that this is rendered probable by the recent investigations of Hedinger and Oehme—then the medullary lymphocytoma is correctly placed with the true myelomata. This would not dispose of the difficulty already mentioned of explaining why the other lymphocyte-forming centres in the body are seldom affected to any appreciable extent. When these are affected, as is the case in exceptional instances—for example when the lymphatic glands are enlarged—this enlargement can usually be explained as due to the influence of intercurrent disease.

If, on the contrary, the lymphocyte be proved to have an origin exclusively foreign to the marrow, then the lymphocytoma occurs in the marrow as a heterologous new formation, and its inclusion under the true myelomata becomes of doubtful expediency. It may be noted that in this class are included some cases which show apparent metastasis, and in which "lymphoid" nodules are found in the fatty marrow in the interior of the shafts of the long bones. These cases recall irresistibly the microscopic appearances found in a case of chloroma which I examined and described in association with Dr. Melville Dunlop. The cells of chloroma closely resemble the large lymphocyte, and it is still uncertain whether they develop exclusively from the osteogenetic layer of the periosteum or from the bone-marrow as well. This similarity is referred to also by Adami. He considers chloroma closely allied to myeloma, and agrees with Dock and Warthin that its cells are of the type of the large lymphocyte, or "*more accurately of the myeloblast type*," that it is an aberrant form of myelomatosis. Chloroma, however, differs in the invasion of the blood by the cells, and in the formation of secondary nodules in many organs. This, moreover, affords support to an explanation of the lymphocytoma which had occurred to me independently, and had appealed strongly to my mind, before I encountered the statement of Adami just quoted, namely, that the lymphocytoma, so-called, is composed of cells which are in reality myeloblasts of comparatively small size. This explanation, provided it be the correct one, yields the simplest solution of the difficulties already discussed, and, further, the homologous nature of the new formation is at once evident.

The Plasmacytoma.—Similar difficulties have to be met in dealing with the plasmacytoma. In myelomata of this variety, the cells resemble closely Unna's plasma cells of inflammatory

tissue. They may be somewhat larger than the myeloblast—a rather unreliable criterion. The nuclear chromatin of the plasma cell is arranged in blocks against the nuclear membrane, so that the clearer parts of the nucleus present a radiating appearance like the spokes of a wheel—" wheel-nucleus," " *Räd-kern*." There is also a finer network throughout the nucleus, and usually a central coarse granule or granules of chromatin. The finely granular or homogeneous cytoplasm is strongly basophilic with methylene blue and allied stains; it is condensed towards the periphery of the cell, so that a faintly stained or clear ring or " halo " surrounds the nucleus. The nucleus is usually excentric. Christian, Hoffmann, and Weber and Ledingham figure cells which completely correspond to this description. Many of the cells in my first case, in sections stained with ripened methylene blue and strongly decolourised, display the same characters. I think there is no doubt that the plasmacytic myeloma forms a not inconsiderable proportion of cases of myeloma, though all the cases described as plasmacytoma are not necessarily authentic. That this opinion is prevalent is evident when one notes how many authorities show a tendency to regard the plasma cell appearance as specially characteristic of myeloma.

J. H. Wright, who first described the plasmacytoma, regards the cells constituting it as in some respects differing from the ordinary plasma cell, and Christian, while admitting that in some cases the apparently authentic medullary plasma cell does not altogether correspond to Unna's cell, argues that the slight differences found are insufficient to brand it as a totally distinct cell, and names it the " bone-marrow plasma cell." Hoffmann discusses the plasma cell question in very full detail and from every aspect, also Weber and Ledingham, and Ghon and Roman. Other writers who describe plasmacytomata are Aschoff, Quackenboss and Verhoeff, Verebély, Lubarsch, Berblinger and Simmonds.

The " bone-marrow plasma cell " has a central or excentric rounded or oval nucleus, just as in the case of Unna's cell; but the chromatin may be scattered in coarse or fine granules throughout the nucleus, and though the cytoplasm is basophilic there is no halo, or only a very imperfect one surrounding the nucleus. Several authors remark that this basophilia is somewhat relative, depending upon the extent to which the decolourising process is carried. Further, it is well recognised that basophilia is a characteristic of young cells, which are not necessarily plasma cells. I have observed similar characters in the cells of my

own cases, particularly the third of these. I would also place emphasis on the fact that whereas many cells, as in my first case, display characters indistinguishable from those of the true plasma cell, all transitions can be discovered, even in closely neighbouring cells, and more especially near the periphery of the circumscribed masses, between that cell, a cell corresponding to Christian's bone-marrow plasma cell, cells admittedly myeloblasts, and even those apparently authentic myelocytes. As a matter of fact it seems unjustifiable to separate all these cells into strict compartments of their own. Different methods of staining may bring out different appearances in the same cell. One example of this may suffice. Ehrlich's triacid stain may give indication of an apparently greater amount of cytoplasm than is demonstrable by, say, hæmalum and eosin, the same section being used, one stain being removed before applying the next.

In fact, I believe that it is probable that the so-called bone-marrow (medullary) plasma cell is not very far removed from the myeloblast.

Even granting this, however, we must accept as authentic, as already stated, the myelomata composed of cells possessing characters indistinguishable from those of the true plasma cells.

But here, again, the question of the homologous nature of this new formation, relative to the bone-marrow parenchyma, presents a difficulty, seeing that the origin of the true plasma cell is still in doubt. Hodara, Naegeli, Pappenheim, Wright, Christian, and others state that the plasma cell occurs in the normal human bone-marrow, though it is not absolutely clear that all these authors refer to the same cell, and their statements are subject to the criticisms already brought forward, that is, if we discuss the plasma cell as a homologous cell, relative to the bone-marrow parenchyma. Most authors regard the plasma cell as related to and probably derived from the lymphocyte; others derive the plasma cell of the marrow and other tissues from the endothelial cells or fixed cells of connective tissue, which would make the plasma cell a cell foreign to the bone-marrow proper, and the plasmacytoma a heterologous formation. Enough has been advanced to show that the nature and position of all the formations described as plasmacytoma are still in doubt, and that the plasmacytoma can be accepted as a true myeloma only with certain reservations.

Erythroblastoma. — Very little can be said with regard to Ribbert's unique case of myeloma composed of cells of megalo-blastic type, which he named erythroblastoma. There is no

reason why a new formation of this kind should not occur; it would be homologous. We must await reports of similar cases. One must note, however, that Christian points out that his bone-marrow plasma cells may become soaked with hæmoglobin diffusing out from degenerating red blood corpuscles, and suggests that the cells in Ribbert's case may possibly not have been erythroblasts at all. It is interesting to note that Schridde reports a rather anomalous variety of myeloma, the erythromyeloblastoma.

I shall not discuss the relationship of myeloma to the leuk-æmias, in which the blood invasion is pathognomonic, and to the pseudo-leukæmias (*e.g.* Hodgkin's disease), in which the lymphatic glands and other lymphadenoid tissue are markedly and character-istically altered, or the distinctions which exist between it and malignant growths of bone. One may dogmatically assert that in true myelomata no one mass, even though of larger size than the others, can be regarded as necessarily the primary focus and all the others as secondary. There is no instance in tumour growth in which the skeleton is exclusively affected, as is the case in myeloma. The available evidence supports the opinion that myeloma is more nearly allied to the system diseases than to the tumours, or, as Adami and Lubarsch put it, it belongs to the group of blastomatoid states rather than to the true blastomata. "Myeloma is becoming, to an increasing extent, regarded as a system disease of a malignant type; the malignancy expressing itself in part in the rapid course of the disease, and in the great destruction of the spongy bone and cortical layers; the deleterious influences based upon the special marrow changes, which cause proliferation of cells which never become fully ripe and never fully functionate" (Berblinger). But in the phenomenon of an apparently simple hyperplasia becoming transformed into an unlimited proliferation, Hart recognises the near relationship between a so-called malignant system disease and true tumour formation.

Etiology.—The arguments which have been advanced by different authors with regard to the etiology of multiple myeloma tend to support the concept of a system disease rather than of a tumour growth. Many of the reported cases have shown a syphilitic history, or one of chronic alcoholism, or one of exhausting work and overstrain, frequently associated with poverty and con-sequent malnutrition. In a majority of cases chronic nephritis has been present. In one family two brothers were attacked by myeloma; in another instance one member of a family suffered

from myeloma, while another suffered from pernicious anæmia. A congenital weakness or insufficiency of the hæmatopoietic apparatus may possibly be the fundamental cause in some cases, so that if this apparatus be exposed to the action of malign toxic influences, such as syphilis, chronic nephritis, or chronic alcoholic poisoning, serious disorganisation of its function results. There is no available explanation of the remarkable phenomenon of the assumption of excessive proliferation by one cell type, coincidently with the cessation of proliferation of the other cell types of the marrow. Hart, indeed, suggests that the different cell types possess a varying degree of dignity in their "*vita propria*"; but this is an unsatisfactory way out of the difficulty.

Klebs and Waldstein hold that a *primary anæmia* is concerned in the etiology, but the proliferative changes occur practically exclusively in active marrow, and not as a reaction of quiescent yellow marrow. Moreover, blood examinations show that anæmia is a feature of the disease in its later stages only. Nor can the *osteoporosis* be regarded as of etiological significance, seeing that in true myelomata this change is always secondary to the marrow changes, and localised to the situations in which these are taking place.

The disease in many cases appears to have originated as a direct sequel of a mechanical injury, as, for example, in Dr. Ewing's case which I report, and in Wm. Mackenzie's case.—*Trauma* is now accepted as of etiological importance in many cases of tumour growth, particularly sarcomata. Nevertheless, while admitting that, in the present state of our knowledge, it is impossible to disprove the correctness of this opinion, one is justified in asserting that it is equally difficult to prove the absence of the disease in an early stage at the time when the injury was sustained.

No one would willingly admit that in a normal healthy adult any conceivable strain or twist could so act upon deeply-seated and protected bones, such as the bodies of the vertebræ, as to produce a system disease of the bone-marrow contained, and that its influence is sufficient to bring about the mysterious rapid overgrowth of one special element in the marrow of many bones simultaneously.

The etiology, therefore, of multiple myeloma, apart from the probable action of obscure toxic influences, is still quite unknown.

Conclusions.—1. Multiple myeloma appears to be a system disease of the hæmatopoietic apparatus, of malignant nature; blastomatoid rather than true blastoma.
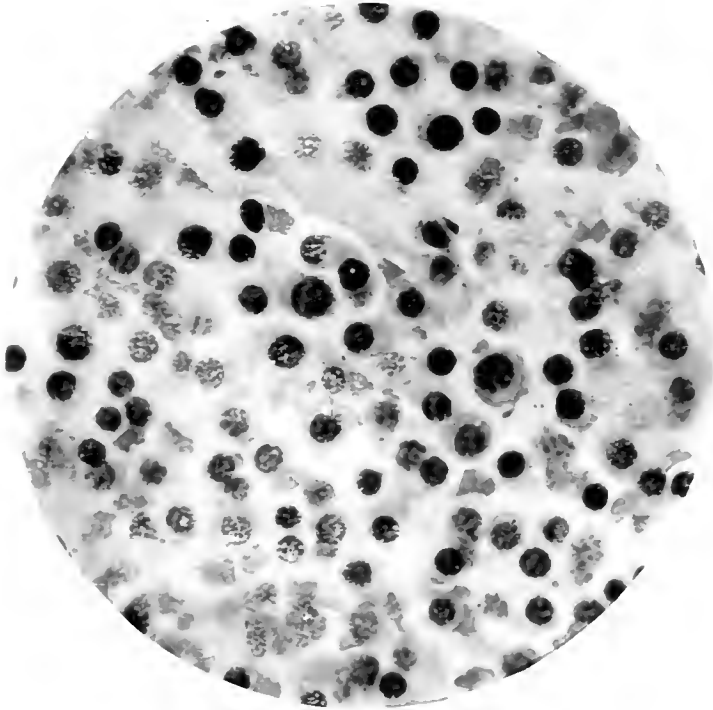
FIG. 1.

Section from mass in body of vertebra in Case I.; stained iron-
hæmatoxylin and picro-fuchsin. The larger cells show some-
thing of the "plasma cell appearance," better seen in Fig. 2.
Red blood corpuscles scattered between the cells. (× 600.)
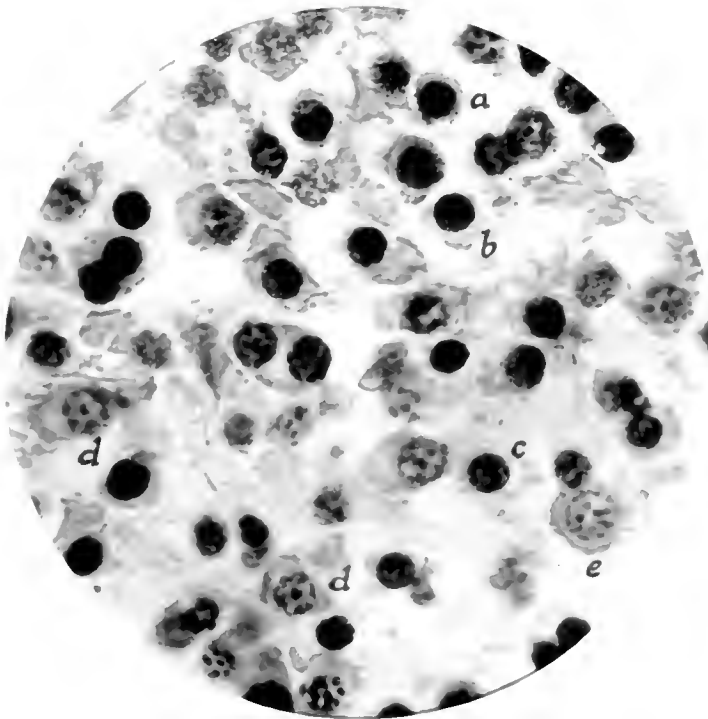
FIG. 2.

Section from mass in body of vertebra in Case I.; stained alcoholic
eosin and Borrel's blue, to show "plasma cell appearance" of the
cells; and, further, the transitions which can be traced between
neighbouring cells, e.g. from a through b, c, and the cell to its left
side, to d, e a degenerating cell. A cell near the centre of the
field possesses two nuclei. (× 880.)

2. It is questionable whether all the different varieties of myeloma described in the literature of the subject can be clearly differentiated from each other. Possibly the apparent differences are due to the variability of one cell type.

3. The apparent metastases do not result from embolism of cells of the new formation in the marrow, but are due to simultaneous transformation of foci of hæmatopoietic tissue present in the organs or to direct local extension.

4. Nothing definite or trustworthy is known with regard to the etiology of the disease.

5. Finally, the nomenclature in common use clinically should be amended.

The name Myeloma should be either restricted so as to indicate only the disease which is the subject of this paper, and for which it was introduced by Rustizky, and it should not be employed to designate all new formations in the interior of bone, including the myeloid or giant-celled sarcoma and other central sarcomata of bone, the cells of which are not derived from bone-marrow parenchyma; or, the term Myeloma should be given up completely, seeing that the termination -oma suggests to many tumour formation, and the term Myelomatosis, which has been proposed, should be adopted generally in place of it, seeing that this term connotes a definite pathological alteration, *sui generis*, of bone-marrow proper.

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GENERAL PARALYSIS OF THE INSANE—ITS PROPHYLAXIS AND TREATMENT:

BEING

THE MORISON LECTURES, 1913.

By GEORGE M. ROBERTSON, M.B., F.R.C.P.,

Physician-Superintendent, Royal Asylum, Morningside, and Lecturer on
Mental Diseases, University of Edinburgh.

II.

PROPHYLAXIS.

THE first step to be taken for the prevention of general paralysis is the thorough treatment to complete recovery of the attack of syphilis. The earlier this is begun the more likelihood is there of attaining success, for primary syphilis is more curable than secondary, secondary than tertiary, and tertiary than latent syphilis. Cure, too, is tested, not by the disappearance of all visible manifestations of the disease, but by a permanently negative Wassermann reaction, for anything else is futile. One dose of salvarsan or a course of mercury may cause a skin eruption to disappear completely without curing the disease or influencing the Wassermann reaction in the blood at all, and we know from experience that most of those who develop general paralysis suffer from latent syphilis presenting no visible signs.

The employment of the Wassermann reaction as a test of recovery from syphilis is possibly its most useful service, for the chief cause of the tragedy of the past was the absence of such a test, one-third of the patients treated not having been cured of their disease. The evils resulting from this we are only now beginning to realise, and they include not only general paralysis and tabes, aneurysm, and aortic disease, but many other organic and nervous diseases with an obscure etiology. Sufficient time has not elapsed to enable anyone to say that a complete cure of syphilis by salvarsan with a permanently negative Wassermann reaction will prevent the development of general paralysis, but it is reasonable to think so.

In a third to a half of the cases of tertiary and latent syphilis the Wassermann reaction continues positive in spite of anti-syphilitic treatment (Boas), and in these prophylactic measures must be adopted. In all cases with a persistent positive reaction in the blood the cerebro-spinal fluid should be examined, because from a very early stage the nervous system may be involved.

Dreyfus found in 80 per cent. of his cases of primary and secondary syphilis, irrespective of the presence or absence of any symptoms pointing to involvement of the nervous system, a lymphocytosis of the cerebro-spinal fluid, which varied with the efficiency of the treatment and the course of the disease. It would thus seem that the nervous system attracts all types of syphilitic organisms, and these observations do not support the view of a special or neurotoxic type. If lymphocytosis be found in the spinal fluid of persons suffering from latent syphilis with a positive reaction in the blood, it is necessary for these persons to lead very quiet lives, avoiding all sources of mental or nervous excitement or exhaustion, and the use of alcohol. Cases of latent syphilis with lymphocytosis have been found presenting no nervous symptoms, and there is no proof existing that cases with a lymphocytosis are more likely to develop general paralysis than those without it; indeed in 10 per cent. of the cases of general paralysis itself there is no definite lymphocytosis. Nevertheless, while all patients with latent syphilis should avoid nervous excitement or strain, this precaution seems specially needed in those cases with a lymphocytosis. It seems also desirable that persons suffering from latent syphilis, with a persistent positive reaction in the blood, should periodically submit themselves to courses of salvarsan and mercurial treatment. Although in a third to a half of the cases of tertiary and latent syphilis the positive reaction persists in spite of the treatment, in over 93 per cent. of these cases (Boas) the intensity of the reaction will be diminished, indicating a lowering effect on the activity of the disease, which it is also reasonable to suppose must be beneficial.

In 9 to 15 per cent. of those suffering from late latent syphilis, with a positive Wassermann reaction in the blood, either general paralysis or tabes will develop. If in the course of the periodical examinations of the cerebro-spinal fluid a partially positive Wassermann reaction be found to occur, with an increase of globulin and the presence of albumen, a very grave view should be taken of the situation. The case should be regarded as one of commencing general paralysis, and the treatment recommended for that disease should be adopted.

TREATMENT WITH A VIEW TO CURE.

The course of a case of general paralysis offers many opportunities for treatment, but I shall only deal here with treatment with a view to cure. The question at once arises, Can general

paralysis be cured, and have recoveries ever taken place? No satisfactory answer can yet be given to this question, for although in the past many cases of supposed general paralysis have recovered, it is not possible to say with absolute and scientific accuracy that these were cases of general paralysis and not of mistaken diagnosis. On the other hand, no one can deny the possibility of general paralysis recovering in the face of the evidence that exists and so long as the diagnosis is uncertain. Till the new serum and cerebro-spinal fluid tests were introduced, the chances of error in diagnosis in experienced hands varied from 6 to 15 per cent., and the probability of an error being made was much greater than that of a recovery. Some cases of cerebral syphilis and of alcoholic insanity not only simulate general paralysis exactly and cannot be differentiated by clinical symptoms during life, but they are also the very class of case which tends to recover, and therefore they are all the more likely to be mistaken for supposed cases of general paralysis that have recovered.

Remission, Arrest, and Attenuation.—The subject of remissions is one which is not without some bearing on this problem, and they offer possibly more valuable information than doubtful recoveries. It is well known that they not infrequently occur in general paralysis, and while they usually last about six months or a year, in rare instances they may last for four or five years. Although all the acute symptoms of the disease are in abeyance during this time, the patient usually shows some mental and physical abnormality, the result of the damage already done. If a disease, by character progressive, ceases to show any signs of activity for 4 or 5 years, it is not inconceivable that it may do so for 8 or 10, 16 or 20 years, or even become arrested permanently.

The most remarkable instance of remission is one recorded by Sir Thomas Clouston of a patient, also observed by me, who lived for over 30 years. During the first 5 years the patient presented the typical symptoms of general paralysis, and was unhesitatingly diagnosed as such on admission to the asylum by Dr. Skae. During the next 15 years the acute symptoms were absent and the disease was stationary. During the 21st year of his illness the acute symptoms returned, only to disappear again for 7 years. They finally appeared again during the last two years of his life—the 29th and 30th since his admission to the asylum. After death the brain was examined by Dr. James Middlemass, and found to present the characteristic appearances of general paralysis. The clinical symptoms of the case are vouched for by three Physician-Superin-

tendents of the Royal Edinburgh Asylum, and the histological signs by a most careful and competent pathologist.

Arrest of the disease or remission of the symptoms of a permanent kind may also occur. Thus Kraepelin quotes the case of Tuczek, which presented the typical clinical symptoms of general paralysis for two years, and who then lived for over 20 years afterwards. On his death the cortex was examined by Nissl, who found the characteristic anatomical changes of general paralysis. Dana of New York, writing on this subject, states that as tabes is often arrested in its early stages, so that the patient lives for 10, 20, or 30 years after, without change of symptom, may not the same process occur in the related disease, general paralysis? and he gives examples.

Two of my cases of general paralysis rather favour the view that the active process tends in the course of years to die out in some cases. One of these had suffered from general paralysis for 12 years, with stationary symptoms for the last 7 or 8, and the Wassermann reaction in both the blood and the cerebro-spinal fluid was negative. The diagnosis was confirmed by the naked-eye appearances after death. The other, with very slight and stationary symptoms, had been affected for 11 years, his cerebro-spinal fluid gave a negative reaction and there was no lymphocytosis, though there was a positive reaction in the blood. This was found to be an undoubted case of general paralysis by Dr. Muirhead and Dr. Ford Robertson, but the histological signs were less extensive and less marked than usual. All of this evidence, if not of a very favourable or conclusive character, at least does not give any support to the contention that general paralysis is hopelessly incurable and fatal.

ANTISYPHILITIC TREATMENT.

For a disease that is believed to be incurable and fatal it is surprising how many remedies have been found, almost all of which have been alleged at one time or another to cure it. It is useless to go over a list which contains such diverse agents as pilocarpin and trephining, radium emanations, and injections of tuberculin, or seriously consider such assertions as that of one observer who stated that he cured 50 per cent. of his cases by injections of nucleic acid.

The form of treatment which I have devised consists in the employment of the following agents, and I am indebted to Dr.

Dods Brown, Dr. Muirhead, and my other assistants for their valuable aid in carrying out its details:—

1. *The Intravenous Injection of Salvarsan.*—The amount used varied with the strength of the patient, but was 0·3 to 0·6 of a gramme for the average man and 0·2 to 0·3 of a gramme for the average woman. These were repeated three or four times at intervals of a month or so.

2. *The Intraspinal Injection of Antisyphilitic Serum.*—This serum was obtained through the co-operation of Mr. Dowden from patients suffering from the secondary stage of syphilis, who had three days earlier been given an injection of salvarsan. This serum is highly charged with syphilitic antibodies, and it was administered because it had been suggested that a possible explanation of the disappointing results of antisyphilitic treatment in general paralysis was the inability of the patient through exhaustion to produce antibodies. This serum was injected intraspinously in order to bring the remedy near the seat of the disease. It was usually administered in the intervals between the salvarsan injections, and it seldom produced any noticeable reaction.

The method of preparation and the amount injected were as follows:—Twenty or thirty c.c. of blood were withdrawn with aseptic precautions by venipuncture from the arm of a syphilitic patient who had been treated three days previously with a full dose of salvarsan. This was allowed to clot, and care was taken to separate the clot from the side of the tube, which facilitates the formation of the serum. At the same time cultures were made from the serum, and the clotted blood was left on ice for about 24 hours. If the serum was sterile it was gently poured into a sterile flask with other sera, thus making a mixed serum, and in some instances it was found necessary to centrifugalise the serum. Ten or fifteen c.c. of this mixed serum, 24 or 48 hours old, was used for injection. A non-sterile or suspicious serum was always discarded. A record syringe was used for the injection of the serum, as the point fits the end of the lumbar puncture needle accurately. Before making the injection the amount of spinal fluid was withdrawn equal to that of the serum which it was intended to inject.

3. *The Intraspinal Injection of Salvarsan Serum.*—Owing to the cerebro-spinal fluid being chiefly a secretion, many drugs, *e.g.*, iodide of potassium, do not reach it; salvarsan administered intravenously is found in it, though only in minute quantities. The

salvarsan serum injected intraspinously was a means devised of bringing the drug in fair quantities into the fluid and into immediate contact with the membranes. It was obtained by drawing off by venipuncture some of the patient's own blood an hour after he had received an intravenous injection of salvarsan. It was only administered on a few occasions, and it was followed by a slight rise of temperature. The direct administration of salvarsan itself intraspinously would almost certainly be fatal, judging by its results on rabbits when thus administered. The salvarsan serum was collected and treated in exactly the same way as the antisyphilitic serum, but the injection was given before the serum was 24 hours old and in smaller doses—3 or 4 c.c.

4. *Urotropine.*—While the patient was undergoing the anti-syphilitic treatment he received full doses of urotropine (10 grs. t.i.d.), as marked improvement has been reported in several cases of general paralysis while undergoing this form of treatment. It is secreted in larger quantities than most drugs into the cerebro-spinal fluid, and thus its bactericidal powers may act here as well as in the bladder.

5. *Calomel.*—This was given twice weekly.

Results of Treatment.

The solid results obtained by this treatment were disappointing, but it seldom happened that a patient did not show some slight improvement in his symptoms after the first or second injection. As an instance of this I mention the case of one patient who wrote several characteristically insane letters just before receiving his injection. Next day he was much improved, and asked the matron for the letters he had written the day previous, and on receiving them tore them up and threw them into the fire. In 5 out of the 12 cases treated at Craig House there was considerable excitement, and all of these benefited and became calmer. Three of the 12 cases recovered sufficiently to be discharged from the asylum, and of these one relapsed after six months, another several months afterwards met with a fatal accident at home, while the third has remained well for a year. This last case was exceptional in having been infected with syphilis 38 years previously, but there was also the history of a possible re-infection 6 years later. Unfortunately, so far as deductions favourable to salvarsan are concerned, it has been my experience to see a similar temporary improvement in the symptoms of general

paralysis from every form of vigorous treatment that I have applied, especially if applied soon after admission.

In none of our patients did the Wassermann reaction become negative, but in a number there was a distinct diminution in its intensity, which increased again later on. On the Continent, Alt and Willige (Browning and Mackenzie) report that they produced a negative reaction in the serum in one-fifth of their cases, but these also in a few months became positive again, although in some cases not for a year and a half. In three of our twelve cases there was a marked diminution in the number of lymphocytes, and in three others it was slight and of a temporary nature. We have found that the number of lymphocytes and the amount of complement deviated in the Wassermann reaction vary without treatment and without apparent relation to the acuteness of the symptoms, but the above changes were of a sufficiently striking nature to be noticed. Roughly speaking, it may be said that in one-half of our cases there was evidence of improvement as regards the Wassermann reaction and the lymphocytosis, signs that the activity of the disease process had been diminished.

CRITICISM OF TREATMENT.

On weighing carefully these results of the use of salvarsan in the treatment of general paralysis, which are similar to those recorded by others, the opinion I have arrived at is that the treatment was not vigorous enough, either as regards the amount of salvarsan administered, the number of the injections, or the rapidity with which these succeeded one another. We were dealing with a new drug, the administration of which in a severe nervous disease was not without an element of danger. Our measures, too, were half-hearted, because our belief in the syphilitic nature of general paralysis was wavering and inconclusive so long as the para-syphilitic theory of Fournier could not be disproved or held as improbable. The situation is now entirely changed by the experience we have gained during the last two years of the treatment of other forms of syphilis by large and repeated doses, and by Noguchi's discovery of spirochætes in the brains of those suffering from general paralysis. Very few persons will now be found to deny the syphilitic nature of general paralysis, and I cannot conceive of any medical man denying that the spirochætes found among the nerve cells of the cortex are one factor in the causation of the symptoms in those cases at least in which they are found. With this sure foundation on which to base our treatment we

can now act with vigour and determination, unhampered by doubt.

It has been found that, speaking generally, the longer syphilis has lasted the more intractable it is to treatment by salvarsan, and general paralysis is a very late manifestation. Judging from this fact alone it might be concluded that it would prove to be intractable, and from the intensity and constancy of the Wassermann reaction it might be inferred that it was not only a late but a very extensive and active infection. It therefore calls for the maximum intensity of antisyphilitic treatment.

In syphilis of the nervous system Dreyfus recommends the total administration of 6 to 9 grms. of salvarsan, injected in doses of 0·3 to 0·4 of a grm. twice a week for a period of 8 to 12 weeks. This is four times the quantity, administered eight times more rapidly than was our practice. If the reaction after each injection be severe, the succeeding injections should be delayed till the temperature has fallen. In addition to this enormous dosage of salvarsan he recommends the employment of mercury, but even this vigorous and combined treatment had no permanent effect on general paralysis, though he claims to have benefited tabes. One wonders whether the injection of salvarsan serum intraspinously in addition would have made a difference, or whether the administration of twice or three times the quantity of salvarsan would not finally have had some arresting effect on general paralysis.

Although success has not been attained there are hopeful indications, for it appears that the disease process, if not suppressed, is at least touched in a half of the cases. The decrease in the lymphocytosis, the diminution in the intensity of the Wassermann reaction, and its disappearance for over a year in some cases, are hopeful signs of the most convincing and satisfactory kind.

THE THERAPEUTIC PROBLEM. —The question now arises, Are we justified in pushing this antisyphilitic treatment to the extreme? Desperate diseases call for desperate remedies, and surgeons operate under conditions in which a definite percentage of their cases are certain to die from the immediate results of the operation, feeling their action justified if the lives of the majority are saved. General paralysis is as desperate a disease as any cancer, for 50 per cent. of those suffering from it die in one year, 75 per cent. in two years, and 90 per cent. in three years, and the existence of the few who survive this period is a living death. Are the ethics of the

surgeon and physician so different that a principle of the former cannot be followed by the latter under circumstances as hopeless and desperate ? Are physicians then justified in general paralysis in pushing salvarsan and mercury to the most extreme limits compatible with survival, in the hope of curing a percentage of their cases ? No doubt under these circumstances, owing to the amount of salvarsan probably required, like the surgeon, the physician would require to be prepared for a certain percentage of deaths.

The time seems ripe for a determined effort on these lines, but the weak point in the advocacy of such a course is the fact that, however hopeful the prospects may seem, no one can assert with confidence that a single case would recover. Syphilis, therefore, should be treated when it is possible to cure it, and seeing that the cause of it is known, an accurate test of its activity exists, and a powerful remedy found for it, it will be a slur in the future on the profession of medicine if the seeds of general paralysis and tabes are permitted to remain in the human soil till it is too late.

EPILOGUE.—In the last series of Morison Lectures which I had the honour to deliver (on melancholia) I expressed the hope that something would be done for the prevention of suicide at the Dean Bridge, and my appeal did not fall upon deaf ears. I hope that something practical may also follow these lectures. The work which I refer to is crying out loudly to be done ; it is the efficient treatment and prevention of syphilis in this city. I think neither the study nor the treatment of this disease have received in this great medical centre the attention they deserve. Judging, too, by the amount of general paralysis, the prevalence of syphilis is greater in this district than in any other part of Scotland, or else it is less adequately treated.

A hundred years ago the President and Fellows of the College of Physicians were instrumental in establishing the Asylum at Morningside for the Care of the Insane. It would only be in keeping with the progressive ideals of medicine that something should be done by them now for the prevention of insanity, and especially insanity of a most grievous form. I therefore hope that they may see their way to inquire into the incidence of syphilis in this neighbourhood and to make recommendations for its efficient treatment. Should good work be done it is not too much to hope that an international movement may yet be started in our lifetime for the abolition of syphilis, and the myriad consequences that follow it.

CLINICAL RECORDS.

INTESTINAL PARASITES IN THE VERMIFORM APPENDIX.

It is a common observation in surgical practice that cases of a particular kind frequently crop up in groups of three, and by such a coincidence it happened that early in 1912, within about ten days, three cases of appendicitis were operated upon in different clinics in the Royal Infirmary in which intestinal worms were found in the appendix.

These cases are included in the following series, together with a number of others which some of our colleagues have been kind enough to record at our request. The *rôle* played by the parasites in the etiology of appendicitis is uncertain. It is by no means uncommon on post-mortem examination to find worms in the appendix, quite apart from inflammation of that organ. G. F. Still found oxyuris vermicularis in the appendix in 25 out of 200 children on post-mortem examination. The same, however, is true of appendicular concretions, and yet these are admitted to have a causative relationship to appendicitis. It does not seem unreasonable to suppose that even if they only act as foreign bodies producing irritation of the mucous membrane the worms play a part in determining the onset of catarrhal inflammation. In 100 cases of appendicitis Erdmann[1] found oxyuris present in 10. It seems highly probable that if the appendices removed at operation were systematically slit up and examined with a lens, parasites of various kinds would be found to be more common than is usually supposed.

It has been suggested by von Moty[2] that different varieties of parasites give rise to different lesions in the appendix, the *ascaris lumbricoides* causing the more acute inflammation which might go on to gangrene, while the *oxyuris vermicularis* and the *trichocephalus* lead to more chronic inflammatory conditions. The cases reported below are too few in number to admit of any such generalisation, but so far as they go they support this suggestion. The majority of the cases in which the threadworm was present were of the chronic or recurrent type. Case XIII., in which round worms were present, showed evidence of ulceration in the appendix, while Case XIV., in which the whipworm was found, showed marked chronic inflammatory changes in the appendix, which in addition was the seat of primary carcinoma.

THREADWORMS (OXYURIS VERMICULARIS) IN THE APPENDIX.

Only in 2 out of the 10 cases of appendicitis in which oxyuris was present was the patient operated upon for acute appendicitis. The others were of a less severe type, and in several there had been

repeated attacks. Contrary to the usual experience, only 3 of the patients were children. The ages of the others were 14, 15, 18, 19, 21, and 38 years. The clinical features of the illness do not seem to present any peculiarity.

CASE I.—*Acute Appendicitis—Threadworms in Appendix.*—T. R., male, æt. 8 years, was admitted to the Royal Hospital for Sick Children, 7th April 1913. Four days before admission there were occasional attacks of colicky pain within right lower abdomen. The pain quickly disappeared. Eight hours before admission, *i.e.*, at 2 A.M., the child wakened with severe pain within right iliac region. Vomiting appeared almost synchronously; both continued until patient's admission. The child had suffered from convulsions when 2 years old. There was no history of worms. On examination the appearances were found to be in keeping with an acute catarrhal appendicitis—muscular rigidity in right iliac fossa, with tenderness on palpation. Pulse 120, temperature 99° F.

The appendix was removed through a M'Burney's incision. It was kinked and in a condition of catarrhal inflammation. Upon slitting it open it contained several small concretions and a large number of threadworms. —(*Reported by* JOHN FRASER.)

CASE II.—*Acute Appendicitis—Threadworms in the Appendix.*—On the 21st January 1912 a lad of fourteen was admitted to Ward 10, Royal Infirmary, suffering from acute appendicitis, with evidence of generalised peritonitis. Two days before, while in school, he was suddenly seized with severe pain in the right side of the abdomen. Next day the pain had settled in the right iliac fossa. There was a tendency to sickness and retching, but no actual vomiting, and he showed signs of commencing peritoneal infection.

On admission to hospital his whole appearance suggested a profound degree of toxæmia—suffused face, sunken eyes, and cold, clammy skin. The pulse was feeble, 120; temperature 97° F.; and respirations 28. The abdomen was distended, tympanitic and tender all over; the muscles were rigid, the maximum tenderness and rigidity being in the right iliac fossa. There was no localised swelling detectable.

When the abdomen was opened the peritoneum was found to be intensely congested, and there was a quantity of sero-purulent fluid among the coils of intestine and in the pelvic pouch. The appendix was turgid, and towards its tip there was a patch of gangrene.

On slitting up the appendix after removal, the mucous membrane was deeply injected, and showed a peculiar velvety appearance except over an area about half an inch from its tip, and just opposite the gangrenous patch a colony of 20 or 30 threadworms was found. Within a few hours of the operation all the signs of general infection had passed off, and the patient made a good recovery.

Six months before he had a similar, though less severe, attack, which passed off within a week. It was not known that he suffered from worms, and none could be detected in the stools while he was in hospital.

The points in the case which attracted our attention were : (1) the appearance of profound toxæmia presented by the boy when he reached the hospital, and the rapidity and completeness with which these passed off after operation; (2) the unusual velvety appearance of the mucous membrane of the appendix, except over the area where the worms were congregated; and (3) the gangrenous patch limited to this area.—(*Reported by* ALEXANDER MILES.)

CASE III.—*Recurrent Appendicitis Associated with Threadworms in the Appendix.*—About midnight on the 28th of March 1912, a boy, aged 8, was admitted to the Royal Infirmary suffering from appendicitis. As the symptoms were not acute it was thought advisable to delay operation until the following morning. On the day of admission the patient had been at school, and on returning home took his tea without complaint, but immediately afterwards lay down, complaining of abdominal pain. There was no vomiting, and his bowels were regular. The patient had had similar attacks during the previous 18 months, sometimes as frequently as twice a week. On the previous occasions he had been treated by his mother for worms, and, as the attacks had passed off, she treated him on this occasion on similar lines, but as no improvement took place she called in the doctor, who sent him up to hospital.

There was slight rigidity of the abdominal wall, but beyond this fact there was nothing abnormal. Rectal examination was negative. The pulse was 120, and the temperature 99·4° F. When the appendix was exposed it was found to be enlarged and inflamed, but not bound down by adhesions. On slitting it open it was found to be packed with threadworms and fæcal matter. The convalescence was uneventful, and the boy, who has recently been seen, has remained perfectly well since the operation. A culture taken from the interior of the appendix gave a growth of bacillus coli.

It is of interest to note that the whole family are known to suffer from worms, and are treated by the mother for such when symptoms arise. (*Reported by* GEORGE CHIENE.)

CASE IV.—*Recurrent Appendicitis Associated with Threadworms in the Appendix.*—The patient was a policeman, aged 38, who had had numerous attacks of pain in the right iliac fossa, the first occurring in October 1912, when he wakened up in the night with severe pain across the abdomen, which soon became localised in the right iliac fossa. He felt sick and feverish, but did not vomit. Since that time he has been troubled with recurrent attacks of dull pain in the region of the appendix, especially after any exertion. He was operated on towards the end of March 1913. When the appendix was opened after removal, several threadworms embedded in fæcal matter were found in it. The convalescence was uneventful. The patient was known to have suffered from intestinal worms, and had been treated for the condition.— (*Reported by* GEORGE CHIENE.)

CASE V.—*Recurrent Appendicitis Associated with Threadworms in the Appendix.*—The patient was a girl, aged 15, who had suffered from four definite attacks of appendicitis during the last five years. The last attack occurred the day previous to admission, and was mild in character. Beyond slight tenderness over the appendix region there was nothing noteworthy in the case. When the appendix was exposed it was inflamed on the surface. On cutting it open after removal the distal end was found to be obliterated, and the remaining cavity contained fæcal matter and seven or eight threadworms.

On further investigation into the history of the patient it was ascertained that she had suffered from, and been treated for, intestinal worms. (*Reported by* GEORGE CHIENE.)

CASE VI.—*Recurrent Appendicitis Associated with Threadworms in the Appendix.*—J. S., æt. 9, had always been a delicate boy, difficult to bring up, and had suffered from worms. In November 1912 he had an acute attack

of appendicitis from which he recovered, but he had a recurrence in January 1913. The appendix was removed on 2nd April 1913. It was adherent to the posterior aspect of the cæcum ; the mucosa was thickened and there was some muco-purulent fluid and numerous oxyuri in the lumen. No ova could be found. His health has improved since the operation.—(*Reported by* J. OLIVER HAMILTON.)

CASE VII.—*Chronic Appendicitis due to Threadworms.*—Wm. A., æt. 18, was admitted to Ward 18, Royal Infirmary, on 11th January 1912. suffering from discomfort and pain in the right side of the abdomen which were believed to be due to chronic appendicitis.

The symptoms were somewhat vague, and he was accordingly kept under observation for some days before operation. His temperature remained normal. but his pulse varied from 64 to 96 per minute. He complained of pains in his right side at different places, front and back, and had some tenderness when the region of the appendix was pressed upon. An X-ray photograph showed nothing abnormal in the right kidney or ureter. The urine contained a few crystals of oxalic acid, but was otherwise normal.

On 26th January the abdomen was opened by the gridiron method over the cæcum. Nothing abnormal could be recognised by palpation in the kidney, ureter, or gall bladder. The appendix was long, and was free from attachment or kink. It was slightly congested on the surface, and at the base was covered with a layer of filmy false membrane extending on to the cæcum. Some swollen glands were present in its mesentery near the cæcum. It was removed, and on being laid open, as soon as the operation was finished, was found to contain a large number of threadworms lying in mucus. The mucous membrane was slightly congested.

The specimen was hardened in formalin so as to preserve the colour and retain as many of the worms in position as possible. The accompanying photograph shows them well.—(*Reported by* CHAS. W. CATHCART.)
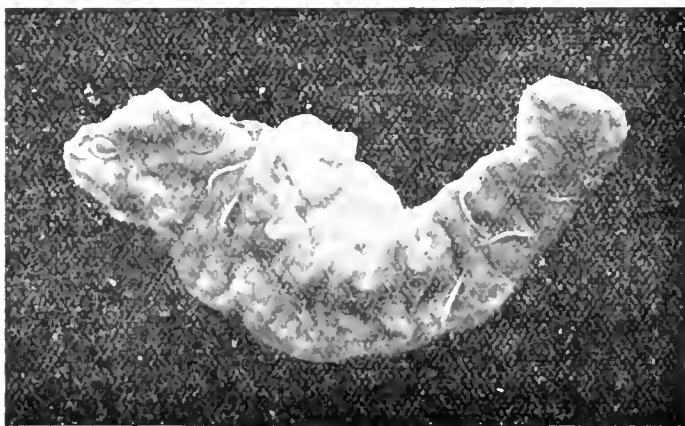
CASE VIII.—*Chronic Appendicitis with Threadworms in Appendix.*—C. M., æt. 15, was admitted from the late Dr. Gibson's ward into Ward 15 on 22nd January 1912. The patient's illness began in October 1911 with a sudden attack of severe pain in the right iliac fossa. She was confined to bed for a week. There was no history of her having vomited. A pain which was described as stabbing in character, and aggravated by violent exercise, continued with intermission on four or five occasions for a day at a time up to the date of admission. The bowels were regular, and there was no history of

her having passed worms. The pulse and temperature were normal. There was some tenderness over the appendix on deep pressure.

On 26th January, when the appendix was removed, it was found to be lying free in the abdominal cavity. It was slightly congested but normal in size. On section the mucous membrane was markedly congested, and the lumen of the appendix filled with numerous threadworms.—(*Reported by* JAMES HODSDON.)

CASE IX. — *Appendicitis— Removal of Appendix in Interval — Threadworms in Appendix.*—J. H., æt. 19, admitted into Ward 16 on 4th March 1913, gave the following history :—When returning from work on the evening of 28th February he was seized with a sudden attack of severe pain in the right iliac fossa. The pain continued until the morning of Tuesday, 4th March, when he vomited. Dr. Heron of Markinch then saw the patient, and advised his removal to the Royal Infirmary. On admission the pulse and temperature were normal. There was slight pain on deep pressure over the appendix ; no abdominal rigidity and no tenderness per rectum.

The patient stated that he had been constipated and troubled with his stomach for about six months. He had never noticed any worms in his stools.

The appendix was removed on 11th March. It was lying in the pelvis, and had become markedly congested, of the thickness of the little finger, and contained some solid fæcal matter. On section and after removal of the fæcal matter by placing the appendix in water numerous threadworms were seen.—(*Reported by* JAMES HODSDON.)

CASE X. — *Chronic Appendicitis Associated with Threadworms in the Appendix.*—A young woman, æt. 24, had suffered from worms since childhood, had always been constipated and was subject to attacks of abdominal pain and vomiting. During the years 1910-1912 she had repeated attacks of severe abdominal pain localised chiefly around the umbilicus, and was treated for gastric ulcer. During an attack she had in January 1912, the most acute pain was in the appendicular region and in the right flank on deep pressure. This passed off in three days. A similar attack occurred in April 1912, and operation was advised. The appendix, which was 6½ inches long, lay behind the cæcum and showed evidence of recent inflammation. The mucosa was greatly thickened and the appendix contained numerous oxyuri vermicularis, and on microscopic examination ova were also found. The patient has enjoyed much better health since the operation and has gained weight. (*Reported by* J. OLIVER HAMILTON.)

The following case (XI.) did not present symptoms of appendicitis, but it illustrates the possibility of worms playing a causative part in the production of intussusception. It is also noteworthy, in that the child recovered after resection of the intussusception.

CASE XI.—*Case of Intussusception Resection- Cæcum and Appendix Contained Threadworms.*— J. S., female, æt. 5½ years. Three weeks previous to admission the child suffered from frequent attacks of abdominal pain and occasional vomiting. These symptoms were usually interpreted as calling for the administration of a purgative, and this was usually given. The resultant motions frequently contained blood and threadworms. Five days before admission such an attack of abdominal pain made its appearance, and

was localised to the region of the umbilicus. The child passed a quantity of blood per rectum. During the subsequent five days there were frequent complaints of abdominal pain ; the bowels moved naturally, and sometimes contained streaks of blood and threadworms. On the day of admission persistent sickness developed, and a tumour with all the characteristics of an intussusception made its appearance in the abdomen.

The abdomen was opened in the middle line, the centre of the incision lying opposite the umbilicus. There was an intussusception which had extended as far as the middle of the transverse colon. Reduction was obtained as far as the ileo-cæcal valve. The intussusception was a modified ileo-cæcal variety. The cæcum was of the fœtal type with a terminal appendix. As a result of the strangulation the cæcum and appendix were partly necrosed, and it was necessary to remove them. The appendix and cæcum contained threadworms, and in all probability the irritation of these was responsible for the primary invagination of the gut. The child made an uninterrupted recovery.—(*Reported by* JOHN FRASER.)

Case XII. illustrates the fact that worms may be present in the appendix without giving rise to any morbid appearances recognisable to the naked eye. It is also of special interest from the point of view of diagnosis.

CASE XII.—*Threadworms in a Healthy Vermiform Appendix.*—P. L., æt. 7 years, was admitted to the Royal Infirmary on 5th March 1912, on the recommendation of Dr. Thin. According to her mother the child had complained occasionally of pain in the lower part of the abdomen for some weeks prior to the onset of her illness. On the afternoon of 4th March she came home from school complaining of severe pain in the abdomen, and was put to bed. In a few hours the pain disappeared, and she got up. In the middle of the night severe pain came on again, and remained until her admission on the following evening. The child vomited once soon after the onset of the severe pain. Her bowels moved on the day of admission. Micturition was said to be painful.

On examination after admission the child's temperature was found to be 102° F., the pulse-rate 160, and the respiration rate 40 per minute. She complained of abdominal pain, had no pain in the chest and no cough. The abdominal muscles were rigidly contracted, the respiratory movement of the abdomen correspondingly restricted, and the abdomen was tender to touch all over. The tenderness did not appear to be distinctly more marked over the right iliac region than elsewhere. There was no distension, and no localised swelling could be made out. The lungs were carefully examined, and no abnormal physical signs could be detected.

On the assumption that the child was probably suffering from appendicitis with peritonitis the abdomen was opened, but no peritonitis was present. The appendix showed no sign of inflammation. It was removed, and on splitting it up the interior was found to be swarming with threadworms. Otherwise it presented no abnormality. On the second day after operation the physical signs of a broncho-pneumonia made their appearance, first on the right side and then on the left. The child suffered from a prolonged illness, but eventually made a satisfactory recovery. The abdominal wound healed by first intention. The case illustrated well the difficulty which

arises in attempting to exclude an abdominal lesion in children, when abdominal pain, tenderness, and rigidity are present in the early stages of a pneumonia before the physical signs of that condition can be detected. In addition it was interesting to note that the appendix could harbour a large number of threadworms without there being any signs of irritation of the mucous membrane.—(*Reported by* J. W. STRUTHERS.

ROUND WORMS (ASCARIS LUMBRICOIDES) IN THE APPENDIX.

CASE XIII.—*Recurrent Appendicitis Associated with Round Worms in the Appendix.*—A neurasthenic female, aet. 32, had complained all her life of dyspepsia and twice became melancholic. In December 1912 she had an acute attack of appendicitis, and a recurrence in January 1913. The appendix was removed on 2nd April 1913. It was thickened and at one point was ulcerated and contained four round worms. The patient is now in excellent spirits and does not complain of dyspepsia.—(*Reported by* J. OLIVER HAMILTON.)

WHIPWORM (TRICOCEPHALUS DISPAR) IN THE APPENDIX.

CASE XIV.—*Case of Chronic Appendicitis and Primary Appendix Carcinoma Associated with the Presence of a Whipworm.*—In a recent article[a] the presence of the trichocephalus trichinosis was noted in a case of primary appendix carcinoma. The appendix was examined along with others from Mr. Miles's collection : it had been removed for symptoms of appendicitis. Although the clinical history is not available it was obvious, from the nature of the lesions, that the appendix had been affected by a chronic inflammatory process. The appendix was kinked in its middle third, and the lumen of this part was occluded by a scirrhous cancer, which apparently had developed at the site of a stenosis. Several concretions were present in the lumen beyond the tumour. The parasite was discovered on microscopical examination of the proximal third of the appendix. It could not be seen by the naked eye, as it was embedded in soft faecal material. Transverse sections of a female whipworm were observed at different levels. These presented the characteristic appearance of a cuticular and muscular layer surrounding a body cavity, which contained an alimentary tube and an ovarian tube filled with ova. The walls of this part of the appendix showed evidence of recent inflammation in addition to chronic inflammatory thickening.

According to C. H. Stiles the whipworm is one of the commonest parasites in man, occurring most often in children between the ages of 3 and 10, and with a frequency which varies from 1 per cent. to 90 per cent. of persons examined in different parts of the world. Its usual habitat is the caecum ; less commonly it is found in the colon, appendix, or small intestine. It is difficult to determine the *rôle* played by the parasite in the etiology of appendicitis. Probably, as in the caecum, its presence is unassociated with pathological lesions in the majority of cases. Girard has observed a case in which two trichocephali were present in the lumen of the appendix, one of them having penetrated the mucosa and become fixed by its anterior end in the wall. Metchnikoff believes that erosions of the mucosa may be produced in this way, and that appendicitis may follow from the introduction of organisms lying on the surface of the parasite. The small size of the worm makes it unlikely that it will act as a mechanical irritant unless by penetration of the mucosa. Von Moty believes that the lesions due to the tricocephalus are generally of a chronic nature.

It is only possible in this case to record the detection of the parasite, as no evidence can be produced which would connect it with the etiology of the appendicitis. The occurrence of intestinal parasites in cancerous appendices is very exceptional. I have only found a reference to one other case, recorded by Bertels, in which the oxyuris vermicularis was found.—(*Reported by* JAMES M. GRAHAM.)

REFERENCES.—[1] *Med. Rec.*, 1907. [2] *Lancet*, 1902, vol. ii. [3] *Edin. Med. Journ.*, 1913, vol. i.

LIGATION OF COMMON ILIAC ARTERY IN HIGH AMPUTATION OF THIGH FOR RECURRENT SARCOMA.

By ALEXIS THOMSON.

THE patient was a married woman, aged 24, who was sent in to the Infirmary by Dr. Gemmell of Airdrie in May 1911.

Five years before Mr. C. W. MacGillivray had removed a tumour from Scarpa's triangle, and there was no return till eighteen months before I saw the patient, when the tumour reappeared in the same situation and gradually increased in size. It caused her no pain, but there was some discomfort in walking. Scarpa's triangle on the left side was filled up by a large solid tumour, over which the skin was tacked down, and was of a dusky red colour. The glands along Poupart's ligament were enlarged and indurated.

I thought it still possible to get rid of the disease by high amputation, relying entirely on a long posterior flap. The operation was done on the 12th May 1911, and the first step consisted in opening the abdomen, obtaining the information that the lumbar glands were not infected, and, following upon this, ligation of the left common iliac artery. The limb was then amputated, the bone being sawn through the great trochanter and the nerves blocked before they were cut across. Owing to the extreme length of the posterior flap a portion of it necrosed. When the slough had separated the X-rays were applied daily to the raw surface for about three weeks.

The tumour on examination was found to be a fibro-sarcoma, and the inguinal glands, although enlarged and indurated, were found not to be infected.

She was readmitted on the 20th March 1912 on account of a bulging of the abdominal scar—a mild form of ventral hernia. There was no sign of recurrence, and her general health was perfect. In operating for the cure of the hernia the opportunity was taken of investigating the condition of the ligated left common iliac artery. It was found to be obliterated from the bifurcation of the aorta throughout its entire extent. No pulsation was felt in the external or internal iliac vessels on the same side.

On the 3rd of April 1913 Dr. Gemmell wrote that she enjoys perfect health, and is a very active woman.

RECENT ADVANCES IN MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF

W. T. RITCHIE, M.D., EDWIN MATTHEW, M.D., AND JOHN D. COMRIE, M.D.

FATAL HÆMATEMESIS FROM GASTRIC ARTERIO-SCLEROSIS.

A CASE, together with the literature of the subject, is recorded by Bitot and Mauriac (*Gaz. des Hôp.*, 13th March 1913), in which death occurred from hæmatemesis consequent upon arterio-sclerosis in the gastric arteries. The patient was thirty-six years old, and had suffered for six years from syphilis. He was very liable to alimentary and to bilious vomiting, with occasional presence of blood, and appeared to suffer from hyperchlorhydria with ulceration. Later he developed symptoms of tabes, loss of reflexes, Argyll-Robertson pupils, etc., and the vomiting increased so much as to suggest gastric crises. This persisted despite division of the posterior roots of the seventh, eighth, and ninth dorsal nerves, and the hæmorrhages from the stomach became also more abundant. The patient finally died as the result of three copious vomitings of blood. Post mortem there was found to be considerable infiltration of the gastric mucous membrane with blood but no erosion whatever. Further, there was no sign of miliary aneurysm in the stomach wall — a frequent finding in such cases — but the vessels generally were greatly distended both outside and in the wall of the organ. As a result of this there had been numerous ruptures of the small arteries, with infiltration of the mucous membrane and detachment here and there of the epithelium. These small arteries on microscopic examination showed advanced arterio-sclerotic changes, but this might readily be overlooked, because the only other arteries which showed a similar condition were the coronaries. The writers call attention to this fact, which explains cases of apparently causeless hæmatemesis, because, as pointed out by Levinne, and as indeed is well known in the case of other organs, the stomach alone may have its vessels affected by arterio-sclerosis, which even the aorta and great vessels escape.

DISORDERS OF THE TWO LOBES OF THE PITUITARY BODY.

An article is contributed by Cushing (*Amer. Journ. Med. Sci.*, March 1913) which deals with the various syndromes of symptoms that appear, according to the manner in which the anterior lobe and the posterior lobe are respectively affected. The writer points out that all the affections of other ductless glands which we recognise are on the

side of insufficiency of the glandular activity, with the one exception of the Graves-Basedow syndrome in the case of the thyroid. Nevertheless he says there should be a characteristic and recognisable syndrome for a primary derangement of each individual gland, whether on the side of its secretory over-activity or of its secretory under-activity. Or it may be that where one state has preceded the other and led to fixed changes of the body we may have the two syndromes mixed. As regards the hypophysis cerebri we have to deal with a dual organ, disease of either of its lobes being capable of producing a very marked set of symptoms which may be combined with symptoms referable to the other in various ways, according to whether one or other lobe is stimulated or destroyed. The conclusions of the writer are in part drawn from the observation of clinical cases, in part the result of experiments conducted by him along with Crowe, Homans, and Goetsch. They have found that skeletal overgrowth depends upon a hyperplasia of the anterior lobe of the gland, which secretes a hormone capable of stimulating growth that is absorbed by the blood sinuses traversing this lobe. The secretion of the posterior lobe, according to these observers, finds its way into the cerebro-spinal fluid, and is required for metabolic processes, being particularly related to the assimilation of carbohydrates. Thus deficiency of the posterior lobe secretion leads to increased tolerance for sugars, with associated adiposity, subnormal temperature, somnolence, polydipsia, and sometimes psychic disturbances of an epileptiform nature. Excess of the posterior lobe secretion on the other hand causes tissue waste, with loss of flesh, intolerance for carbohydrates, with glycosuria, moist skin, etc. Secondary derangements of other glands are very apt to occur, as, for example, of the generative organs, which are activated in cases of hyperplasia, and become atrophied or fail to develop when the posterior lobe is hypoplastic. Three distinct syndromes are clinically recognisable :—

I. *Acromegalic Syndrome*, in which the anterior lobe is hyperplastic, the posterior lobe at first undergoing a similar change and later becoming defective. These cases show gigantism or acromegaly, with an active metabolism and glycosuria at first, passing later to adiposity, subnormal temperature, tolerance for sugars, and the rest.

II. *Syndrome of Dystrophia Adiposogenitalis*, or the syndrome of Fröhlich, in which atrophy of both parts of the gland has taken place. When this occurs early in life, as it usually does, the stature remains small, the patient is adipose, and the genital dystrophy may cause absence of the secondary characters of sex.

III. *Syndrome of Overgrowth with Adiposity*, which is due to an atrophy of the posterior lobe, often caused by pressure of neighbouring tumours, with a secondary stimulation of the anterior lobe. In this case acceleration of growth, often with hypertrichosis, marked adiposis, with increased sugar tolerance, are very marked symptoms. Illustrative cases are

recorded, and two typical cases of overgrowth with adiposity are shown by photograph.

LYMPHOCYTOSIS OF INFECTION.

Four cases are recorded by Cabot (*ibid.*), illustrating the fact that the usual polynuclear leucocytosis of infective conditions may at times be replaced by a lymphocytosis so pronounced as to suggest the presence of a lymphatic leukæmia. The septic causes in these four cases were respectively wound infection, boils, a "cold" with enlarged cervical glands, and a streptococcic sore throat. The count of white cells varied round about 20,000, 16,000, 9000, and 30,000, while the proportion of lymphocytes present among these was respectively 70, 82, 71, and 75 per cent., the polynuclears making up practically all the remainder of the white cells. In all the cases there was recovery from symptoms and return of the blood to normal in a few weeks or months. The writer discusses the differential diagnosis of these cases from tuberculosis and from leukæmia. In the case of the latter the degree of lymphocytosis is higher, 90 per cent. or thereabout, and there is no obvious source of infection to cause the enlargement of glands, while the disease becomes progressively worse instead of gradually disappearing, like the simple leucocytosis.

FUNCTIONAL EXAMINATION OF THE KIDNEYS BY PHENOLSULPHONPHTHALEIN.

It is recognised by every practitioner that the method of attempting to estimate the condition of the kidneys by means of the amount of albumin passed is quite fallacious, and that the examination for tube casts and the other methods in vogue are not much more satisfactory. Considerable attention has therefore been paid of late years to discovering some test which will indicate from the urine the secretory power of the kidneys. One of the latest of these is the phenolsulphonphthalein test of Rowntree and Geraghty. Erne (*Munch. med. Woch.*, No. 10, March 1913) and Fromme and Rubner (*Ibid.*, No. 11, March 1913) publish results of their experience with the test. It is simply carried out by injecting with a hypodermic syringe the contents of an ampoule of phenolsulphonphthalein solution (·006 grm. of this substance in 1 c.c. of water) under the skin or into a vein. The patient should drink a large tumblerful of water twenty or thirty minutes before the injection, and his urine is collected and examined at intervals of one, two, and three hours after. The amount of phenolsulphonphthalein passed at the end of each period is estimated by means of a special colorimeter. Normal individuals, according to Rowntree and Geraghty, after hypodermic injection show the presence of the substance in the urine in 5 to 11 minutes, at the end of one hour have excreted 50 per cent. of the amount injected, and by the end of the second hour 60

to 85 per cent. of the total. Fromme and Rubner, having investigated 120 presumably normal persons, do not agree with these amounts and periods; for trustworthy results they require the observation period to be extended to three hours, and state that on the average healthy people excrete 70 per cent. of the phenolsulphonphthalein introduced into the system within three hours, although one must not regard the kidney function as abnormally low if only 60 per cent. be passed in this time. Erne, on the other hand, agrees with earlier observations that an amount of less than 45 per cent. in the first hour and of less than 70 per cent. in the first two hours indicates a pathological condition of the kidneys. His results in 48 persons whose urine contained albumin and casts gave figures round about 40 to 60 per cent. for the first two hours, being particularly low in cases diagnosed as chronic interstitial nephritis. He regards the test as one which is not only readily applied but very valuable, as giving information upon defects of kidney function not elucidated by the albumin test.

PROGRESSIVE LENTICULAR-NUCLEUS DEGENERATION.

Cases resembling the symtom-complex described recently by Lhermitte and by Wilson (*Brain*, 1912, pt. iv.), of which the chief features during life are giddiness and intellectual deterioration occurring in families, and passing on later to dementia, are recorded by Homen (*Fortsch. d. Med.*, 13th March 1913). These cases are found after death to show a degeneration of the lenticular nucleus and a multilobular cirrhosis of the liver, as well as in some instances interstitial changes of other organs. In Homen's cases there were five members out of one family consisting of eleven brothers and sisters affected in the same way. Their troubles began with repeated attacks of giddiness, headaches, and loss of appetite during early adult life. Mental deterioration followed, and the patients succumbed to various intermittent diseases. The chief point which Homen makes in his paper is the presence of congenital syphilis as the cause, and he regards all the cases of this symptom-complex as due to delayed congenital syphilitic manifestations. It was impossible definitely to establish syphilis of the parents, but facts suggestive of this were an abortion early in their married life, death of four children in the first two weeks of life, and presence of widespread interstitial and vascular changes in the organs of three surviving to early adult life (19 to 26 years). Further, two were greatly benefited by an antisyphilitic regimen, one who still survives being perfectly well, and another who developed the disease being so much benefited by a course of mercury inunctions (at the age of 19) that she insisted on going home. The last patient shortly after developed, and died of, pulmonary phthisis, and post mortem the internal organs showed the changes characteristic of the symptom-complex in question.

J. D. C.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

DURING the past few years a large number of operative methods have been devised and practised, chiefly by German surgeons, for the treatment of pulmonary phthisis. Based on the fact that the natural cure of tubercle is effected by fibrosis and contraction of the tissues involved, and that in the case of the lung this process is hampered by the rigidity of the thoracic cage, various methods have been evolved, all of which have as their objects the encouragement of pulmonary fibrosis by diminishing both the size and the respiratory excursion of the affected lung. It need hardly be mentioned that these methods are suitable only for cases of unilateral disease, or for those in which the disease in the other lung is very early and restricted.

Artificial Pneumothorax.—This method, introduced independently by Forlanini and Murphy, aims at keeping the lung in a state of more or less complete collapse, and so favouring the shrinkage of cavities and the cicatricial contraction of the diseased areas. Extensive and dense pleural adhesions will, of course, preclude its employment. Forlanini (*Deutsch. med. Woch.*, 1911, S. 2313 u. 2380) recommends the intrapleural injection of 200 to 300 c.c. of nitrogen at the first sitting. This is repeated on alternate days until all the breath sounds are abolished, after which an injection every three to four weeks will be found sufficient to maintain the pneumothorax. It is advisable to expose the pleura by an incision, under local anaesthesia, before inserting the needle for the introduction of the gas.

This method has now been widely used, with, on the whole, very favourable results.

Thoracoplasty.—It would appear that in operations which mobilise and render collapsible the chest wall over the diseased lung a promising line of surgical treatment has been opened up.

Friedrich (*Journ. Amer. Med. Assoc.*, 1912, vol. ii. p. 269) has practised extensively, and with good results, an operation consisting of the resection of portions of ribs in the mid-axillary line. His operation resembles Schede's operation for old-standing empyema, and consists in the dissecting up of a large flap from the side of the chest, the flap containing the serratus magnus with its vessels and nerves. Portions from 10 to 25 cm. long are then resected from the second to the tenth ribs, the pleural cavity not being opened. This allows of retraction of the parietal pleura, and permits of a certain degree of shrinkage and collapse of the lung. The greater part of the operation can be carried out under local anaesthesia, but in many cases there is considerable

shock. Wilms (*Münch. med. Woch.*, 1913, No. 9, S. 449) and Sauerbruch (*Ibid.*, No. 12, S. 625) both emphasise the importance of allowing a sinking in of the chest wall over the apex of the lung, and advocate the removal of portions of the upper ribs near their vertebral and sternal extremities. Wilms performs a two-stage operation for this purpose. In the first stage he makes a long paravertebral incision, and resects portions 5 cm. in length from the vertebral ends of the upper five or six ribs. Six to eight weeks later he makes a vertical parasternal incision, and resects portions of the sternal ends of the upper four or five ribs. This usually gives a sufficient mobilisation to allow of shrinkage of the upper lobe of the lung, but in a few cases where it has proved inadequate, as evidenced by persistent expectoration and the X-ray picture, he has at a third operation removed a portion of the sternal end of the clavicle with very gratifying results.

Sauerbruch has found that to obtain uniformly good results in cases where there is extensive disease of one upper lobe mobilisation of the upper portion of the chest is not in itself sufficient ; the whole lung must be put at rest. In two cases in which he had performed a thoracoplasty over the diseased upper lobe, there followed a rapid extension of the disease in the lower lobe apparently due to aspiration of tuberculous material. This danger, he finds, may be averted in one of two ways—either by a preliminary resection of portions of the lower ribs posteriorly, or more readily, and possibly more efficiently, by section of the phrenic nerve on the affected side, paralysing the corresponding half of the diaphragm. Schepelmann (*Ibid.*, No. 9, S. 490) studied experimentally the effects of section of one phrenic nerve, and found that after such division the diaphragm rose to the position of maximum expiration, compressing the lung, and that it took no further part in respiration. It showed, indeed, slight paradoxical movements, being drawn up with inspiration and descending with expiration ; these movements, however, were so limited that for practical purposes they might be disregarded. Sauerbruch has divided the phrenic nerve in the human being in five cases. In two cases of tuberculous disease of the upper lobe of one lung he followed up the phrenicotomy by a thoracoplasty over the affected lobe, and this combination, in his opinion, admirably fulfils the therapeutic indications, namely, rest to the lung, and facility for contraction and fibrosis in the diseased area. The phrenic nerve is divided in the neck where it lies on the scalenus anticus, the best exposure being obtained by an incision along the posterior border to the sterno-mastoid muscle.

Although it is as yet too early to draw conclusions in regard to the part which surgery is destined to play in the treatment of pulmonary tuberculosis, it would appear to have been established that in a certain type of the disease, namely, the unilateral indolent variety, surgery offers not only a rational but also a most successful line of treatment.

POST-OPERATIVE GASTRO-ENTERIC PARESIS.

The large number of cases of this post-operative complication which has been recorded within the past two years is evidence of the frequency of a condition which until lately must have been often wrongly diagnosed. J. T. Pilcher (*Med. Rec.*, 1st March 1913) has personally encountered 60 cases, and his experience affords many instructive data. The importance of early recognition and prompt treatment of this condition is borne out by the statistics of Nicolls and of Pilcher. The former, in a statistical review comprising 225 cases, found a mortality of from 65 to 70 per cent., whereas Pilcher in his series had, owing to early diagnosis and treatment, a mortality of below 5 per cent. Regarding the etiology of this complication two views are held—the one is that the great dilatation of the stomach and duodenum is secondary to a compression of the third part of the duodenum by the root of the mesentery and its contained vessels ; the other is that the primary factor is a gastro-enteric paresis, and that compression of the duodenum, when it does occur, is an entirely secondary phenomenon. Pilcher is a strong advocate of the latter view, and, while admitting that both factors are operative in the fully-developed condition, he agrees with Smith that in these cases "there is present a general alimentary paralysis, and the primary obstructing factor is to be found in the paralysed bowel." This intestinal paresis is almost certainly of reflex nervous origin, and usually follows operations involving manipulation of organs in the region of the semilunar ganglia. Thus the majority of cases have occurred after operations on the biliary passages, duodenum, and pancreas, but it is noteworthy that it has also occurred after kidney operations. Payer (*Mitt. a. d. Grenz. d. Med. u. Chir.*, Bd. xxii. No. 3) lays great stress on the paretic effect of general anaesthetics on the stomach as a factor in the etiology. From numerous careful observations he found that after general anaesthesia it was the invariable rule to get a greater or less degree of gastric dilatation and paresis. The value of his observations has been lessened, however, by the fact that acute gastro-enteric paresis has occurred after operations performed under local anaesthesia.

Whilst the cardinal symptoms of this condition are vomiting, distension, and collapse, there are certain prodromal symptoms which it is very important to recognise, the latter including restlessness, depression, excessive thirst, increasing rapidity and feebleness of pulse, and scanty urine. Frequently there is no vomiting after the operation, and sometimes two or three days may elapse before the patient begins to bring up mouthfuls of bile-stained fluid. A feature of these cases is that the vomiting reflex is suppressed, and the fluid brought up is merely regurgitation from an over-distended stomach, so much so that sometimes the slightest movement of the patient will cause fluid to well up into the mouth. There rapidly develops in this

condition an almost pathognomonic languor and apathy, and these are gradually replaced by symptoms of definite collapse. Abdominal distension is usually well marked, but sometimes it is deceptively slight, a condition which is apt to lead to a false diagnosis. If recognised early and properly treated the prognosis is very good : in untreated cases there is a mortality of over 70 per cent. Treatment consists essentially in early and repeated gastric lavage, and there can be no contra-indication to the use of the stomach tube. The best solution to use is warm water with a small quantity of sodium bicarbonate added to it. After washing out the stomach stimulating enemata should be given. In Pilcher's experience intravenous injections of from 20 to 40 c.c. of hormonal have given very gratifying results in these cases. All cathartics must be withheld until the stomach has been thoroughly evacuated. Postural treatment, so strongly advocated by some writers, was never found to be necessary in any of Pilcher's cases. Operative treatment is altogether unnecessary, and should not be considered.

D. P. D. W.

DISEASES OF CHILDREN.

UNDER THE CHARGE OF

G. H. MELVILLE DUNLOP, M.D., AND A. DINGWALL FORDYCE, M.D.

HÆMORRHAGIC DISEASE OF INFANTS.

THERE has been little progress in recent years in the treatment of hæmorrhagic disease of the newly born. Much has still to be learnt with regard to the cause of the disease, but the use of serum therapy seems to have marked a distinct advance in the treatment. It has been applied in the form of blood transfusion, by the subcutaneous injection of animal serum, human serum, and whole human blood. The percentage of reported cases of recoveries is so high as to justify the assumption that the use of blood and its derivatives by these various methods is of therapeutic value in this disease.

Two recent papers, one by Vincent, read at the Philadelphia Pediatric Society, and the other by Welch, read before the St. John's Guild for Children, New York, bear this out in a very striking manner.

When treated by the older methods hæmorrhagic disease of the new born was characterised by a very high mortality, varying according to the different authorities from 35 to 89 per cent., representing a probable average mortality of 60 per cent. An exception to this statement has to be made in regard to cases treated by the gelatine method, which has been largely used, chiefly in Germany. The result of this method of treatment, in the hands of some, appears to have largely diminished the mortality, while others again have pronounced

it to be absolutely without effect. Human blood serum was first used by Welch in 1909. He reports in 1910 that in 12 cases in which he adopted the subcutaneous injection of human blood serum, all were cured. The infrequency of this disease and the rapidity with which it proves fatal makes it extremely desirable that we should have a well-known specific with which to combat the disease. The beginning of the condition is not always the same. The baby may be in every respect apparently healthy, when suddenly, without any warning, it may vomit a quantity of fresh blood or pass tarry stools, and these may be the only indications of hæmorrhage. The bleeding may be subcutaneous, of a petechial character, or occur as hæmatomata. The umbilical stump, a divided prepuce, or the gums may be the sites of the hæmorrhage. Fatal internal hæmorrhage not infrequently occurs without external manifestations, and may affect the brain or any of the thoracic or abdominal organs. These patients may show icterus or may simply grow pale, become feeble, and die, without apparent adequate cause. The hæmorrhages are usually within the serous cavities or beneath a serous membrane, such as the pleura, the pericardium, or under the capsule of the liver or kidney, or in the peritoneal cavity. Welch believes that the underlying condition in these bleeding cases has to do with the endothelium lining the blood-vessels, and he thinks that the disturbance in the balance of these cells is the immediate cause of the hæmorrhage. The disturbance, he believes, is due to malnutrition. In the babies suffering from this affection we find marked putrefaction, hypersecretion of mucus, and bad odours indicative of decomposition in the colon. The decomposition is accompanied by the production of toxines, which are absorbed, and interfere with the nutrition of the endothelium, possibly by producing a cloudy swelling and upsetting the balance between the ferments and antiferments of these cells. It will be seen from the foregoing that he does not believe that the hæmorrhages are due to some abnormal condition of the blood itself, or that it is a blood disease. He has treated successfully 35 cases with normal human blood serum, which he believes controls the hæmorrhage through its nutritional effect, especially on the endothelium lining the blood-vessels, and not through any action it is supposed to have in coagulating the blood. These hæmorrhages usually occur, he maintains, after some special disturbance of nutrition, sometimes of a chronic nature, but in other cases it appears to resemble an acute toxæmia. It appears to be a species of auto-intoxication originating in the excessive growth of pathogenic bacteria in the intestine, with absorption of large quantities of toxines which have a deleterious effect on the nutrition of the endothelium of the blood-vessels, thereby producing conditions leading to hæmorrhage. The normal human serum is a prepared food, having molecules with receptors which fit the receptors of the cells of the

endothelium, and in that way are capable of being incorporated into the cell body as nourishment without any energy being expended in the process of digestion. The nutrition being thus restored the balance of the ferments is re-established and the hæmorrhage is stopped. He considers that transfusion has its uses in cases of very marked depletion from prolonged hæmorrhage, in which the cellular elements of the blood are greatly diminished. In such cases transfusion, by supplying the cells necessary to the blood, is a measure of practical value, and one which no other agent or means of treatment can replace. For the majority of cases, however, he prefers to use normal human blood serum, as he considers that transfusion is accompanied by certain dangers, as hæmolysis, thrombosis, and embolism, all of which may cause the death of the patient. He also considers transfusion a difficult operation, and that it is frequently necessary to repeat it several times, and in this it is at a great disadvantage with normal human blood serum, which can without difficulty be repeated frequently and used indefinitely.

Vincent, on the other hand, believes that animal and human blood serum are frequently ineffective, and that transfusion is a much more valuable method of treatment. He admits, however, that his experience is largely confined to the treatment by transfusion, and that he is therefore prejudiced in favour of this procedure. He argues that if the bleeding in many of the cases is due to a defect in the infant's blood it would seem that transfusion is the ideal method, because it restores directly to the infant's circulation all the elements needed for coagulation. In addition, transfusion possesses the advantage of correcting the anæmia by replacing the cellular elements which have been lost by the hæmorrhage. Probably the best line of treatment to adopt in these cases is a rational combination of all three methods. In those in which the bleeding is rapid and profuse, and which are usually quickly fatal, an immediate transfusion is indicated. The disease, however, often begins with trivial hæmorrhage, and in these cases injection of blood serum is indicated. Cases again which are not seen until the infant is exsanguinated by hæmorrhage are more safely treated by transfusion. Although the procedure is more formidable than simple injection, the results are immediate and more permanent. Although most cases of hæmorrhage may be saved by one or other of these methods, there are two forms of the disease in which a cure cannot be effected by any form of treatment. The first form includes those cases in which the underlying cause of the bleeding is fatal in itself, such as bacterial infection, syphilis, and ulcers of the stomach and duodenum. The second form comprises hæmorrhages into the brain, adrenals, kidneys, and liver, in all of which the location, and not the extent of the bleeding, is the vital factor. With these exceptions, in a very large percentage of this hitherto exceedingly fatal disease a cure can be effected by the use of human blood or its derivatives.

The Inclusion Bodies in Scarlet Fever.

When Dölile of the Pathological Institute at Kiel described the inclusion bodies in the blood of patients suffering from scarlet fever during the first four days of the illness, it was hoped that a means had been found of making a definite diagnosis in this illness, and that we should no longer be subjected to anxiety regarding those indefinite cases with a slight rash and a still slighter throat affection which are often the cause of so much doubt and trouble in private practice. The inclusion bodies are small corpuscular elements within the protoplasm of the leucocytes, and distinguished from the nucleus by being less intensely stained. They vary in size from a micrococcus to a large bacillus, and may be either ovoid, pyriform, or crescent shaped. These bodies are found in the polymorphonuclear leucocytes and in them only. They are quite distinct from the nucleus, and are frequently found towards the periphery of the cell. The number of cells containing the bodies and the number of bodies present in each cell vary, and bear no relation to the severity of the illness, though they seem to diminish in number with the duration of the attack. Dölile was the first to draw attention to the diagnostic importance of these bodies, and his observations were confirmed by Krutchner of Strassburg and Williams of New York.

In a recent research conducted by Drs. Grange and Pole at the London fever hospitals 191 cases of scarlet fever and 192 cases of other infectious diseases were examined, with a view to estimate the diagnostic value of these bodies and to ascertain—(1) If inclusion bodies were present in all cases of scarlet fever. (2) The date of their disappearance. (3) If they were also present in diseases that might be mistaken for scarlet fever, *e.g.*, measles, diphtheria, and septic rashes.

As a result of their investigations they arrived at the following conclusions :—

1. Except in the extremely fatal toxic type of scarlet fever the inclusion bodies will probably be found in every genuine case during the first four days of the illness. Their absence practically excludes scarlet fever.

2. The bodies are present in almost every case up to the fourth day, after which they appear with lessening frequency, and are absent in most cases after the eighth day, though in some few cases they may be found as late as the third or fourth week.

3. The bodies are found in quite a large proportion of cases of diphtheria, measles, and tonsillitis, therefore their presence or absence is of no use in making a differential diagnosis between these diseases and scarlet fever.

4. The bodies are found in most diseases caused by ordinary pyogenic organisms, especially if streptococci are present.

5. They are absent in toxic rashes.

6. Finally, it is impossible to diagnose scarlet fever from film examination alone.

Bognart (*Berlin. klin. Woch.*, 1912, lxi.) made a similar series of investigations in 80 cases, to determine whether Dölile's inclusion bodies were pathognomonic of scarlet fever, and all his examinations were checked by two assistants, and he considers that these bodies are absolutely devoid of any diagnostic value whatever. Of the 80 children examined, 59 were ill and 21 in good health. In the 21 healthy children the bodies were present in 17 and absent in 4. As the result of his investigation he concludes that the inclusion bodies are found in the protoplasm of children generally.

They apparently increase in number, and are found in almost all the leucocytes during febrile conditions. It is not possible, he maintains, to consider the inclusion bodies pathognomonic of any one disease, and certainly not of scarlet fever. G. H. M. D.

DERMATOLOGY.

UNDER THE CHARGE OF

W. ALLAN JAMIESON, M.D., and R. CRANSTON LOW, M.B.

Chronic and Recurrent Diseases of the Skin in Relation to the Heart and Circulation.

In a preliminary communication on the subject, Walsh (*Urol. and Cut. Rec.*, January 1913) deals with a number of chronic skin conditions which he has found to be very frequently associated with some circulatory disturbance. He maintains that latent or unsuspected heart trouble is comparatively common amongst patients seeking relief from some chronic skin lesion. The circulatory inadequacy apparently determines the onset of the eruption. The skin whose circulation is not normal is very prone to dermatitis from irritants such as great heat, chemical irritants, soaps, etc. The author quotes several cases where severe inflammation of the skin followed exposure to the sun or artificial heat in individuals whose skins, previous to the presence of the heart lesion, were unaffected in such a manner. Apart from the well-known lesions such as Raynaud's disease, chilblains, etc., where the vessels play an important part, there are several lesions, especially of the hands and feet, which various authors have ascribed to an unstable vascular equilibrium. Such diseases include hyperidrosis of hands and feet, cheiropompholyx, symmetrical hyperkeratosis of palms and soles, and chronic inflammatory diseases of the finger-nails To disturbances of the surface circulation Walsh puts down the irregular action of drugs on the skin. This, too, might explain why in some skin cases a vaccine acts so well, whilst in other apparently identical cases it has no effect at all. Therefore, in order to secure the full

local effect of internal remedies, we should combine them with methods capable of flushing the skin with an adequate supply of blood, *e.g.*, Bier's congestion method. What is called "idiosyncrasy" to certain substances when applied to the skin may in many cases be a reaction to moderate traumatism on a skin whose circulation is defective. In this way the irregular incidence of trade and drug eruptions might be accounted for. In all cases of delayed healing of the skin after moderate traumatism of any kind the state of the heart and circulation should be carefully investigated.

The Genital Lesions of Diabetes which Simulate Venereal Diseases.

The commonest skin lesion in diabetics is the well-known itchy dermatitis which occurs so frequently on and around the vulva in females. But it is not so well known that the corresponding inflammation in males, a balano-posthitis, may be so severe as to resemble other conditions. Whitney (*Ibid.*, February 1913) has recently drawn attention to such cases. In one case the patient complained of an ulcer in the coronal sulcus of the penis. This looked like a primary sore, was very much indurated to touch, and had only been present a few weeks. Examination of smears failed to demonstrate the spirochæte, and although kept under observation no secondary rash developed. The only point in which the case differed from a primary sore was in the absence of any glandular enlargement in the groin and the failure to find the spirochæte in smears. The urine was examined, and found to contain 3 per cent. of sugar. The healing of the lesion with no subsequent symptoms, after antidiabetic treatment, showed its non-venereal nature. The author also quotes cases where a balanitis with ulceration, which was diagnosed as a tertiary syphilitic lesion, was associated with glycosuria, and disappeared as soon as treatment of the diabetes was undertaken. In lesions on the penis of diabetics the diagnosis is frequently rendered more difficult by the swelling of the prepuce, leading often to considerable phimosis. When this is extreme a secondarily infected balanitis may very closely resemble gonorrhœa. Sometimes small ulcers are also present which look extremely like soft sores, but in these cases, as in the lesions resembling primary sores, the inguinal glands show no enlargement. In some cases of diabetes the genital region of the male shows a scaly dermatitis, with patches of eruption on the penis and scrotum. These latter often resemble secondary syphilitic eruptions. A simple œdema of the penis may also occur in diabetics. Such cases show clearly that in diabetes there may be various lesions on the genital organs which closely resemble those of venereal origin. Whether they are caused by the direct irritation of the sugar on the tissues or in the blood stream, or by the lessened resistance to bacterial infection, is still doubtful. Of course

all forms of venereal disease may occur in diabetics, but apart from the fact that ulcers may take longer to heal than in healthy individuals, such cases do not show any peculiarity. In all such cases where a lesion is not typical in its history, its course or its reaction to treatment, the urine should be examined for sugar.

A Small Epidemic of an Areate Alopecia.

Colcott Fox (*Brit. Journ. Dermat.*, February 1913) describes an epidemic of a curious form of alopecia which occurred in a school. The patients were all girls whose ages ranged from 9 to 14 years. The first case was admitted to the school in 1907 with the disease under discussion, and during the next two years was discharged, and readmitted to the school on two different occasions, always with alopecia. In October 1909 fifteen girls were admitted to the school, all affected with small bald patches. A few weeks later other 5 girls were admitted, making 21 cases in all. The patients were all admitted from the Bethnal Green schools at Leytonstone, and all came from one house at the schools. The patches of alopecia were all small, varying from the size of a finger-nail to a shilling. The areas were not shiny, were nearly denuded of hair, and for the most part showed "exclamation mark" hairs such as are usually seen in cases of alopecia areata. Many of the follicles where hairs had fallen out were plugged with pigmented débris. The borders of the patches were not definitely circumscribed. In almost all cases only a single patch was present. This might be located on any part of the scalp. Repeated examination of stumps and plugs from the follicles failed to reveal any fungus or organism of any kind. All cultures were negative. The clinical features were those of alopecia areata, but the small size of the patches, their frequent oval or lanceolate shape, and their rapid yielding to treatment were all points of difference from ordinary alopecia areata. The patches were not scars, and there was no trace of impetigo, which frequently leaves bald patches for a considerable time after the impetigo lesion itself has disappeared. All the cases rapidly got well on the application of ung. hydrarg. oxidi rubri with cantharides, and no further patches developed. In Fox's experience evidence of contagion in alopecia areata in London is scanty, although the disease is very common. He has, however, seen many examples of family alopecia areata in which members were affected at different ages, but without the striking evidence of contagion seen in ringworm. In contrast to ringworm, alopecia areata shows a marked tendency to recur. Fox's own experience of ordinary alopecia areata is that it is not contagious, and it has been his practice to certify that cases are fit for school if the general health is good.

Infantile Eczema and Indigestion.

The effect of diet on eczema in babies has long been recognised as important, but very little is really known about the actual state of

the digestion in such cases. Towle and Talbot (*Amer. Journ. Dis. Child.*, October 1912) have recently undertaken an investigation on this subject. The children were put on a diet whose composition and daily amount were known. The stools were examined microscopically and by a qualitative and quantitative chemical analysis, so as to find out not only the type but the degree of maldigestion. The authors found the acutely inflammatory form of eruption associated with exudation is the one in which digestion is at fault, whereas in the less intensely inflammatory forms of eruption the digestion is good. The stool findings show that a non-digestion of fats and of carbohydrates occurs definitely and regularly in association with infantile eczema. Most often it was found that an intolerance of fat was associated with skin manifestations. The investigation was undertaken on a comparatively small number of cases, all under two years of age. As similar cases of non-digestion of fats or sugars are found in infants who do not suffer from any skin eruption, the authors conclude that some underlying condition, probably systemic, is also present in the cases where the skin is affected.

Lingual and Oral Mucous Membrane Disturbances in Pernicious Anæmia.

Wise (*Journ. Cut. Dis.*, February 1913) draws attention to the occurrence of a stomatitis and glossitis as an early sign of pernicious anaemia, and quotes a case where soreness of the tongue and mouth was present for a long time before any other symptoms of pernicious anaemia. The presence of such a stomatitis supports the view that the disease is due, in some cases at least, to oral sepsis. The characteristic feature of the stomatitis in these cases is its periodicity. Frequently weeks and months elapse during which the patient forgets all about his tongue; then follow periods of great discomfort, which last for from a few days to several weeks. During the periods of well-being the tongue either looks normal or has a slight superficial glossitis, such as is often seen during an attack of indigestion. During the attacks the mucous membrane of the tongue has a glazed, faintly atrophic appearance, the edges and tip showing a beefy-red inflammatory surface. The whole buccal and pharyngeal mucous membrane shows a diffuse hyperaemia, and the mucous membrane of the floor of the mouth may become swollen and oedematous. There is great discomfort, especially when eating and drinking. The condition resists local treatment and disappears spontaneously, only to recur without apparent cause. The attacks of stomatitis do not necessarily synchronise with the periods of greatest anaemia, and in the case quoted by the author the oral disturbances showed a decided diminution both in severity and frequency as the pallor of the skin increased. In all cases of obscure recurrent stomatitis it is advisable to examine the blood.

NEURODERMATITIS CHRONICA FACIEI (*Lichen Simplex Chronicus Faciei*).

Under the above name Hoffmann (*Dermatol. Zeitschr.*, February 1913) draws attention to an eruption which should be distinguished from eczema. This disease is met with most frequently in the groin and perianal region, about the elbows and on the back of the neck, but the variety on the face is not so well known. It occurs in elderly individuals on the forehead, cheeks, nose and eyelids. The skin is red, wrinkled and folded, and from the constant scratching has a shiny appearance like lichen planus. It is distinguished from lichen by its situation and the absence of the violet colour. Although the whole area looks somewhat like lichen, there are no typical angular papules at the edge of the patches. In such cases the itching is very severe and its characteristic feature is that it comes on periodically, often very suddenly, lasts some hours and then diminishes or disappears till the next attack. During the attack the patient cannot keep his hands off the skin. These spasmodic attacks of intense itching are very similar to those seen in bad cases of pruritus ani. The disease runs a very chronic course and is very resistant to treatment. The affected parts are usually dry, unless a superadded dermatitis from scratching is present, or some strong application has been made. The attacks of itching are often brought on whenever mental work is engaged in or if the patient becomes excited. It is usually worst in the evening. The eyelids are always affected and may show some œdema. There is great irritation of the conjunctiva and the lips may also be affected. The cause of the condition is unknown. The disease begins with pruritus and seems to be connected with the nerves of the skin. Possibly intoxications (tobacco, coffee, alcohol, tea) and auto-intoxications from the alimentary canal play a part in its production. The treatment must be different from the ordinary seborrhœic dermatitis of the face. Removal of any toxic absorption, if possible, is the first necessity, but local treatment is required also. It is useless to employ the usual soothing lotions, etc. ; they only give temporary relief. Hoffmann obtained the best results by the use of a 5 to 10 per cent. tumenol-ammonium paste or ointment. This alone hardly ever cures the case; in addition it should be painted daily with pure coal tar or solut. lithanthrac. acetone. The latter is a cleaner and pleasanter application than ordinary tar. If that is not sufficient, X-rays should be applied at intervals of a week, giving one-third the erythema dose each time. After 3 applications there should be an interval of 3 to 4 weeks before another cycle of X-ray applications is made. R. C. L.

INFECTIOUS DISEASES.

UNDER THE CHARGE OF

CLAUDE B. KER, M.D.

Inhalations of Hot Air in the Treatment of Diphtheria.

Rendu (*Lyon Médical*, 12th January 1913) reports a series of cases of diphtheria in which the throat lesions were treated by heated air, applied by means of a tube. In his view such inhalations cause an immediate relief to the sore throat, exercising a sort of analgesic action. The hyperæmia which follows may also be of value, as may the increase in glandular secretion which appears to be excited. But the principal action he regards as a bactericidal one, and he suggests that, if the bacilli are not actually destroyed, their virulence and power of producing toxin is very much diminished. Rendu disclaims any idea of substituting this method of treatment for the use of serum, but considers that the two methods can very well be carried out together. Nevertheless to test the value of the hot air he treated two series of cases, one, as usual, with serum, and the other by his new method, and found very little difference in the results. He tabulates in his paper the main features of the cases composing each series, and points out that, so far as severity of type is concerned, there is little to choose between the two groups. The air, heated in a contrivance analogous to the electric drying apparatus of hairdressers, was administered through a flexible metallic tube, the nozzle passed into the mouth and suitably protected. The temperature attained ranges up to 110 C. The heated air may be given as long as tolerated, and then intermitted for a minute or two, and a *séance* lasts about 5 minutes. The average patient had 4 or 5 *séances* in the first three or four days. The hot air appeared to cause the disappearance of membrane at least as rapidly as did serum. The fever on an average was only slightly more prolonged. One patient, however, admitted free from laryngeal symptoms, developed croup subsequent to the commencement of hot-air treatment, while, as we would have confidently predicted, no such accident occurred in the serum-treated group. With this exception there is very little difference in the results of the two series of cases, each of which included 33 patients, the serum series having only a slight advantage in the case mortality—24·24 per cent. as against 27·27 per cent. The deaths, however, appear in many instances to have been due to broncho-pneumonia and not to uncomplicated diphtheria; there were no cardiac deaths for instance, and the palate was the only situation in which paralysis manifested itself. Many of the patients, moreover, appear to have contracted measles, and this in reality was the cause of death. One is tempted to conclude that if a similar experiment was repeated in cases of uncomplicated diphtheria

of a somewhat more severe type, the patients treated by hot air alone would not compare so favourably with serum-treated cases. It is also a little difficult to see how a temperature great enough to destroy or limit the activities of the bacilli could be tolerated sufficiently long by the patient. Rendu tells us that children of from 4 to 8 years in a *séance* of 5 minutes inhale air at from 20° to 60° C. for 2 minutes, 70 for 20 seconds, 90 for 15 seconds, 100° for 10 seconds, and 110 for 5 seconds, older children being of course more tolerant. This does not seem to expose the germs in the membrane to a high temperature for long enough to modify them effectively. Rendu's paper is none the less very interesting, although we hardly think he will find many imitators. He suggests that, as a substitute for serum treatment, his method might fairly be indicated in tubercular subjects, in patients who have previously had a dose of serum and in whom anaphylaxis is dreaded, and in patients who have just had another infectious disease such as measles, as in the last-named circumstances serum is often very disappointing.

Treatment of Erysipelas by Vaccines.

Yoshihiro Takaki (*Sei-i-kwai Med. Journ.*) has treated 16 cases of erysipelas by vaccines. In some of the cases a stock streptococcus vaccine was used, but in the majority of the patients the vaccine employed was autogenous. Although many of the cases were very serious, in no instance did death result. When the condition came early under treatment the illness was, in Takaki's opinion, shortened, and in certain cases the effect was almost instantaneous. Auto-vaccines were found more efficacious than stock vaccines. The exact dosage is not given, but injections appear to have been made at intervals of two days. A study of the cases in detail suggests that the stock vaccine was of little, if any, value. It is true that the inflammatory process was apparently checked abruptly in some cases, but erysipelas is a disease of such uncertain duration, and so often terminates by crisis, even when no specific treatment is used, that we are not very impressed with the results. On the other hand the use of the auto-vaccine was somewhat more successful. Here again, however, if we apply the test of the number of recurrences, the treatment does not seem convincing. Three patients suffered from relapse—a high proportion even for untreated cases. On the whole, therefore, granting that a number of severe cases did extremely well, it would be unsafe to lay very much stress on the value of a method of treatment which is still, after all, only in the experimental stage.

Serum Treatment of Whooping-Cough.

Rosenthal (*Arch. gén. de méd.*, January 1913) gives an interesting summary of the recent work of the Russian observer Klimenko on

whooping-cough. The bacillus of Bordet and Gengou is not yet entirely accepted as the cause of the disease. The chief evidence in its favour is the fact that it is in many cases agglutinated by the serum of convalescents, and that the latter gives constant positive reactions with the deviation of complement test. Klimenko has carried the researches of the French writers to a further stage. While he failed to produce whooping-cough in most laboratory animals, he was successful in causing an analogous condition in puppies and monkeys by means of inoculation of the nasopharynx with the bacillus in question. The cough set up, however, was not spasmodic, although sometimes followed by vomiting. Puppies often died of pneumonia some weeks after inoculation, and the inflamed areas of lung gave cultivations of the Bordet-Gengou bacillus. Klimenko failed in his endeavours to procure an active toxin, and concludes with the French observers that their bacillus only elaborates an endotoxin. This naturally made it unlikely that an active therapeutic serum could be prepared. Immunising experiments, however, were carried out on rabbits, dogs, goats, and sheep. Intramuscular or subcutaneous injections always caused necrosis of tissue locally, and intravenous injections were ultimately employed. Forty-eight-hour-old cultures on gelose in sterile saline solution were used, at first previously killed by heat, and later in the living state. Many of the animals, however, died in the process of attempted immunisation. The serum, nevertheless, when obtained was proved experimentally to have considerable power. Injected into laboratory animals previous to the inoculation of 2 or 3 lethal doses, it prevented the fatal result. It possesses agglutinating power (1 in 5000), contains specific opsonins, and produces deviation of complement. Klimenko also treated 35 patients with the preparation, using hypodermic doses of from 25 to 50 c.c., or rectal doses of from 50 to 100 c.c. He considers that while his serum does not abort the course of whooping-cough, it invariably diminishes the violence of the accesses, and also the number of whoops. Curiously enough the effect on the cough was most noticeable at night. The duration of the illness appeared to be shortened, but the figures given are not very convincing. It would be very gratifying to find a really scientific and successful treatment for this distressing disease, but the difficulties in the production of serum seem so great, and the action so uncertain, that it does not appear that in the meantime we can expect much from the method.

A Municipal Tuberculosis Sanatorium.

The *Boston Medical and Surgical Journal* (23rd January 1913) contains an interesting review of a report of Dr. H. M. Biggs of the New York City Health Department on the sanatorium at Otisville. This institution appears to be constructed entirely on the "outdoor"

principle, that is to say, of 500 patients not more than 25 can under any possibility be placed within 4 walls. This is the more remarkable when it is understood that many second- and third-stage patients are treated, and that the atmospheric temperature may fall to zero in winter. The grounds are very extensive—between 1300 and 1400 acres. Originally it was intended that the institution, like other sanatoria, should care only for cases of incipient disease, but it is stated that experience has shown that there were many reasons for changing this view. Perhaps the most important is that in the majority of cases occurring among the poor the disease, when recognised, is no longer incipient. Incipient cases, moreover, are so little troubled by symptoms that many individuals will not stop work and enter a sanatorium. On the other hand, cases in the second stage of the disease do often quite as well as the incipient ones, and even well-advanced third-stage cases often show a surprising improvement. Advanced cases are therefore taken at Otisville, and the idea is, if they do not show improvement after two or three months, to transfer them to hospitals for advanced cases in the city. The New York scheme, then, is remarkably comprehensive, and the patients at Otisville illustrate all the stages of tuberculosis. The recognition, in this manner, of the claims of the second-stage case is satisfactory, as too often in Edinburgh such cases have, as it were, fallen between the two stools of the sanatorium and the hospital for advanced cases, being too advanced for the first and not sufficiently ill for the second. The Insurance Act, however, is removing this anomaly.

Typhus Fever in Boston.—The curious sporadic cases of fever, described by Brill of New York as occurring not infrequently in that city, have, as most of us who were interested in the subject confidently expected, been definitely identified with typhus fever. Lee (*Boston Med. and Surg. Journ.*, 23rd January 1913) has subjected to a critical review the medical records of the Massachusetts General Hospital to ascertain whether Boston as well as New York unconsciously harboured this particular infection. The cases investigated were those clinically classed as typhoid fever, and all cases of indefinite fever during the last 10 years. Lee succeeded in finding records of 28 cases which corresponded fairly well to Brill's description of the disease, which was for some years called by his name, and is now generally regarded as mild typhus fever. These cases gave negative blood cultures and negative Widal reactions to both the typhoid and paratyphoid bacillus. They were scattered fairly evenly through the period investigated, but 17 of them occurred in the four months, June to September. In 15 there was a definite crisis, and the lysis in the remainder did not take more than 72 hours. It is interesting to note that, as was the case with the patients treated by Brill, a very high proportion came from Eastern Europe, 18 of the 28 having been born in Russia, and only

3 in the United States. The most important feature of the recent observations of American physicians on this disease is that typhus fever must now be regarded in a new light, and that it is capable of a sporadic existence, and may show an extremely low degree of infectivity and also a very trivial death-rate. It is curious that these modified cases have not yet been identified in Great Britain, where small outbreaks of the disease still occur.

MENTAL DISEASES.

UNDER THE CHARGE OF

JAS. MIDDLEMASS, M.D., AND DOUGLAS M·RAE, M.D.

INSANITY DUE TO TUMOUR OF THYROID.

IN the *Gazette des Hôpitaux* (5th November 1912, p. 1745) Drs. Horand, Puillet, and Morel relate a case of insanity due apparently to a tumour of the thyroid. The patient was a man aged 39, who, from the age of 9, suffered from a swelling in the neck. It grew in size very slowly until about a year before he was admitted to hospital, when the tumour had become so large that he decided to have it removed. For many years he was looked on as an eccentric. He wanted to know everything, and read many books, chiefly of a scientific kind. He had formed his own ideas of Creation, of Nature, and of many other matters, and had formulated them in a system which appeared to him perfectly satisfactory. He had embodied these in a voluminous treatise, which, however, no one would publish, so in a fit of pique he burned it. He also suffered from hallucinations of many kinds. He imagined himself to be animated by a spirit which he named Elébram, and which inspired all his thoughts. His intelligence seemed latterly somewhat degraded from its previous level, which admittedly was above the average. The tumour was completely removed and found to be a mass of caseous material, such as is found in some dermoid cysts. The wound healed rapidly and satisfactorily. There was subsequent to the operation a remarkable mental change. After his return home he was reported by his relations to have resumed a normal life, all mental symptoms having disappeared. It is, of course, not an unusual thing for an insane person to recover after an operation of any kind, but the facts of this case seem to strengthen the view that the thyroid has a specially intimate relation to brain activity.

MENTAL DISTURBANCES PRODUCED BY THYROID FEEDING.

As thyroid medication has been strongly advocated as a remedy in certain cases of insanity, and is extensively used for this purpose, it is perhaps as well that attention should be drawn to some of the risks that may be incurred in so doing. Professor Roque describes (*Progrès méd.*, 20th July 1912, p. 354) a case in which acute mental symptoms

followed the taking of thyroidine for the treatment of slight obesity. The patient was a woman of 34, a professional dancer and acrobat. As she was becoming slightly stout, and thought this was impairing her professional abilities, she began to take small doses of thyroidine in order to reduce her weight. She took these for 20 days and then suffered from indigestion, with nausea and sickness, insomnia, giddiness, palpitation, and feelings of anxiety. She at once stopped the thyroidine and the symptoms passed off. Some years later, however, in spite of her previous experience, she resumed taking the drug for the same reason. She took it for four or five weeks. Her previous symptoms recurred, but did not on this occasion disappear, when the drug was stopped. In addition she suddenly became violently maniacal, had hallucinations and delusions, and required treatment in an asylum. Under this she soon recovered, and Professor Roque had no doubt, from the similarity of her symptoms to those of exophthalmic goitre, that they were entirely due to the thyroidine she had taken. She was rather phlegmatic than neurotic, and not one predisposed to have her mental balance upset. From this case and several others referred to in the paper it is evident that thyroid is a most potent drug, and that great care must be exercised in its use, otherwise the remedy may prove more dangerous than the disease.

Insane Soldiers in War.

Now that armies are many times larger than they were a century ago, and that much greater attention is devoted to their surgical and medical treatment in the field, it is to be expected that the care of insane soldiers should come to the front. No account seems to have been published of the number of such cases which occurred in the South African War, but in view of the large number of men engaged it cannot have been small. Statistics have been published of the incidence of insanity among the Russian soldiers in the Japanese War, and these are rather startling. The ratio is considerably higher than in the civil population or than in the army during peace. It was at least 1 in 250, and was probably even higher. In an army of half a million this works out at 2000 cases of insanity. In a recent paper Dr. Révész (*Wien. klin. Woch.*, 12th December 1912, p. 1965) advocates the organisation of special means to deal with the large number of cases which are likely to occur in future wars. He recommends the appointment of mental specialists for service at the front and at base hospitals to assist in the recognition of these cases, and in dealing with them when discovered. He considers the best way is to send them back as quickly as possible to the asylum of their native district. This might be quite feasible in a continental country, but in an insular country, fighting far from home, this method would hardly be practicable. In any case it seems desirable that steps should be taken to have

available in war time a trained service to treat and nurse these cases as they arise. In this country less attention seems to have been given to this matter than on the Continent.

METABOLISM IN INSANE PATIENTS.

For some time past a number of valuable researches into bodily metabolism in health and disease have been carried out at Vienna. Though these have not yet led to any very striking results, they are undoubtedly forming a basis upon which further work can be built, and in time, no doubt, valuable results will accrue. Similar researches are now being undertaken by Italian investigators, and a paper by Dr. Nizzi of Reggio Emilia (*L'Encéphale*, October 1912, p. 245) gives the results of one of these. The particular line of investigation pursued by him has been the relation of the nitrogen, phosphorus, and fat ingested to that excreted. The cases selected for observation were of manic-depressive insanity and of dementia praecox. Only those cases could be chosen who would submit to the special course of dieting prescribed, and all but one of the five cases went through the treatment satisfactorily. The diet consisted of measured quantities of milk, eggs, sugar, salt, and water, the chemical constituents of which could be, and were, accurately determined. This diet was continued for 12 days, during the first two of which no estimations were made. The full details of the results are given in a series of tables.

The author's conclusions are as follows:—In one case of manic-depressive insanity nitrogen was absorbed in insufficient quantity. The ratio of nitrogen to phosphorus in the food taken and the similar ratio in the excretions showed on comparison that there was a disturbance in metabolism as regards these elements. Lecithine was not broken up, as it is in the normal state.

Of four cases of dementia praecox observed, two were in the acute stage, two in the chronic. The former showed an excessive elimination of both nitrogen and phosphorus, in the latter there was a remarkable retention of these. In the one metabolism was increased, in the other it was diminished. The body weight showed evidences of these processes, falling in the one case and rising in the other. This, of course, is in accordance with clinical experience, and supports the rationality of increased feeding during the excited periods of the disease. Further evidence in the same direction was furnished by the excretion of fat, which in the acute cases was found to be considerably higher than in the chronic. Lecithine showed a parallel relation also.

J. M.

SUBACUTE AND ACUTE INFLAMMATORY REACTIONS PRODUCED IN THE SPINAL CORD BY INFECTION OF ITS LYMPH STREAM.

This paper (*Rev. Neurol. and Psychiat.*, September 1912) consists of a further series of experiments performed by Orr and Rows on the

subject of lymphogenous infection of the nervous system in continuation
of their classical work begun in 1903. The pathological findings in
these investigations continue to provide suggestive analogy to those
of general paralysis, and are of the greatest interest and importance
to the alienist. In the previous experiments celloidin capsules con-
taining a broth culture of various organisms were kept in contact with
the sciatic nerve of rabbits and dogs. Although a degeneration of the
myelin sheath of the nerve fibres in the spinal cord resulted, inflamma-
tory reaction was either absent or extremely slight.

. In the present series of experiments the writers set out with the
object of producing a myelitis of the cord. The capsule containing
the organism was therefore placed in a position much nearer the cord,
in order to diminish the distance along which the infection had to be
conveyed. The lumbo-sacral enlargement was exposed and a capsule
stitched to the dura, or placed against an intervertebral foramen under
the muscles covering the dorsal spine. Cultures of staphylococcus
aureus were used, with positive though variable results. In some
cases the organisms escaped into the tissues by the bursting of the
capsule and an acute inflammatory reaction followed, instead of the
subacute phenomena in the cases where the capsule remained unbroken
and only toxic material had invaded the tissues. Thus two types of
changes were produced—that in which no organisms were present,
and that in which organisms could be traced to the dura. The
microscopical appearances throw considerable light on the production
of myelitic conditions, both acute and chronic. The author's view
that general paralysis is a chronic inflammatory disease of lymphogenous
origin is still more fully borne out as the result of the similarity of
the vascular lesions in general paralysis and those experimentally
produced by infecting the lymph system. They strongly oppose the
view that the disease is of hæmatogenous origin, while the theory of
premature decay of the neuron has never been explained. They point
out that, co-existing with pronounced periarteritis and neuroglial pro-
liferation, the nerve cells may show a remarkable degree of preservation.
No selective neurotoxic action can serve any longer to account for the
morbid picture, either in acute myelitis or in general paralysis. A
minute analysis of the extension of the inflammatory reaction in the
various tissues and a critical account of the various kinds of cells and
their staining reactions (too detailed, however, for summary) are
given. As the result of the first series of experiments, in which only
toxin infiltration occurred, the authors conclude that plasma-cell
formation is the most prominent indication of the attempt of the
tissues to neutralise the invading poison. The proliferation of the
adventitial cells of the venules and capillaries and plasma-cell formation,
while the arterioles remain intact, are features which are constant, and
serve to explain the generally-accepted theory that lymph regains the

general circulation through the walls of the veins and capillaries, and any toxic substance contained produces irritative effects.

In the second series, where the capsule had broken and micro-organisms escaped into the tissues, a much more intense reaction naturally occurred along the intercostal nerves to the posterior root ganglia and dura. In addition to a leucocyte invasion, parallel rows of "fibro-blasts" (polyblasts), large lymphocytes and organisms, were found outside the dura. Endothelial and adventitial cell proliferation of the vessels in the cord took place, with the formation of polyblasts resembling polymorphonuclear leucocytes. On some of the vessels were considerable collections of cells showing eccentric deeply-stained rounded nuclei with reticulated appearance of the cytoplasm, the spaces being clear or containing less deeply-stained material. These cells correspond to the "epithelioid" cells and *Körnchenzellen* possessing the function of removing degenerated tissue. Throughout the white and grey matter of the cord round-celled infiltration around the vessels, stasis with fibrin formation, and a swollen condition of the endothelial elements were evident. Further irritative change was seen in the proliferation of the neuroglia to form the large "amoeboid" cells of Alzheimer. Acute degenerative changes—atrophy, coagulation necrosis, and chromatolysis—were to be seen in the nerve cells, while in portions of the cord invasion of the neuron by small round cells (neurophagy) in various degrees was to be observed. Necrotic change in the nerve fibres of the lateral columns had occurred, the myelin sheaths being destroyed and the axis cylinders swollen and twisted.

An exceedingly interesting and exhaustive resumé is given of the various investigations and findings, which have led to a revolutionising of opinion on the etiology and pathology of acute anterior poliomyelitis. Wickman has shown that the infection is chiefly a perivascular infiltra-tion of the tissues, with round cells derived from wandering lymphocytes of the adventitia (polyblasts). Although resembling polymorphs on account of nuclear indentation, these cells have a distinctive morphology. Their nuclei contain less chromatin, arranged in granules connected by threads to form a network. The cell body, moreover, like the lymphocyte, is basophilic. The appearances in acute poliomyelitis are essentially the same as those induced experimentally by Orr and Rows. Thus an infection of the lymph stream must be held responsible for the lesions seen in infantile paralysis. This is in agreement with the findings of Wickman and Romer, and is still further supported by the experimental production of fatal poliomyelitis in apes injected by Romer with an emulsion of diseased spinal cords into the sciatic nerve, the symptoms first appearing on the side of injection. The clinical association of gastro-intestinal disturbances with post mortem finding of enlarged mesenteric glands suggests the path of infiltration along the lymphatics of the sympathetic nerves to the central nervous

system.   It is further pointed out that an intense reaction occurs in the posterior root ganglion, near the distal end of which the sympathetic nerve joins the spinal nerve.   The periarteritis of general paralysis and trypanosomiasis is, in the opinion of the authors, evidence of lymphogenous infection of a subacute or chronic character, while acute infections along the lymphatic paths give rise to poliomyelitis by continuity, which reaches its maximum in the acute ascending paralysis of Landry.   The appearance of the inflammatory reaction in the posterior root ganglia they consider is strongly in favour of Homen's belief that these ganglia act as traps or filters, and form a barrier against the further centripetal passage of organisms or toxins.   They suggest from analogy that in herpes zoster lymphogenous extension has been checked by these ganglia, and the patient is thus protected from an attack of meningo-myelitis in some form or other.

In addition to a careful enumeration and description of the various forms of cells met with in the inflammatory reaction of toxic invasion of the nervous system, the authors discuss the vexed question of the origin and nature of these cells in an exhaustive and illuminating manner. They make out a strong case for the view that all forms of cell reaction —plasma cells, polyblasts (fibroblasts), epithelioid cells, *Körnchenzellen*, etc.—can be traced through the wandering lymphocyte to the adventitial and endothelial elements.   Confusion, they believe, has arisen from the abuse of the term "typical" as applied to the appearance of any one form, and a lack of study of cell reaction in its earliest stages.   In order to understand the significance of a reaction it is necessary, they say, to consider the cause, its intensity and duration, as well as the morphology of the infiltrating cells.   Friedman's conclusions are summarised somewhat as follows:—(1) All the different forms of reaction can be produced by the same agent or by any sufficiently strong stimulus, whether it be that which causes meningitis, or an embolism, an aseptic wound, a corroding agent, or excessive heat. (2) The whole complex series of changes, from round-celled infiltration to the softening with *Körnchenzellen*, or to the intense reaction with large-celled proliferation and giant cells, may be present in one and the same case.   (3) The more intense inflammations progress by steps, and these steps form pictures previously regarded as separate varieties of encephalitis—hæmorrhagic, parenchymatous, or hyperplastic. Thus not the particular kind of cause, but its intensity and duration, are the essential factors in determining the pathological appearances. The products of slight parenchymatous degeneration may be got rid of by the neuroglia without any infiltration of tissue (Schmaus).   If the breaking down of tissue is more extensive, phagocytic wandering cells appear.   If still more acute destruction of nerve cells and fibres with liquefaction of the tissues occurs, an inflammatory exudate of leucocytes first appears and only later do phagocytic elements (*Körnchenzellen*, etc.)

develop. Nissl's experiments with Indian ink injected into the subdural space, freezing of nervous tissue, and the application of chromic acid are quoted in support of these views. In the authors' experiments, where only toxins gained access to the tissues, the reaction was of the plasma-cell "type," the mildest reaction being the presence in the adventitia of cells having rounded deeply-stained nuclei and but little cytoplasm, with swelling of adjacent neuroglia (*cf.* general paralysis). In the second series, where the capsule had broken, the quantity and intensity of the irritant were greatly increased, and a polyblast "type" is substituted to mark the primary phase of the reaction, the secondary reaction being demonstrated by the appearance of compound granular cells (*Körnchenzellen*) and epithelioid cells to absorb the products of degeneration, in addition to the power of absorption of micro-organisms possessed by the polyblasts of the primary reaction. They affirm that the division of the cells into polyblast, epithelioid, and *Körnchenzellen* is purely arbitrary and artificial, being merely the same under differing conditions. They can be traced, like the plasma cell, to the adventitial and endothelial elements of the vessels, in whose wall, as in the meshes of the pia, the infected lymph is circulating. They are merely intermediate forms to mark the primary and secondary phases of acute or chronic infection, and their appearance depends on the potency of the irritant to give rise to the mildest irritation or actual destruction of tissue. D. M‘R.

NEW BOOKS.

Internal Medicine. By DAVID BOVAIRD, Jun., M.D., Assistant-Professor of Clinical Medicine in the College of Physicians and Surgeons of Columbia University. Pp. 618. Philadelphia and London : J. B Lippincott Co. 1912. Price 21s.

PROFESSOR BOVAIRD is to be heartily congratulated upon what is really an advance in the writing of text books on internal medicine, inasmuch as he has attempted to introduce a greater number of illustrations than are to be found in most similar volumes. He lays stress upon this in the preface, and if he had only carried out his intentions a little more fully he would indeed have earned the lasting gratitude of the present generation of students and junior practitioners. Why, for instance, has the author entirely neglected many of the anatomical and pathological diagrams usually to be found in text books on medicine which boast of any illustrations at all? Such aids to the meaning of the letterpress and to the memory of the reader are in our opinion essential, but a second edition may enable the author to remedy this serious omission. We also believe that the value of a text book is greatly enhanced by the printing of headings of what may be termed typical or characteristic clinical features in heavier type, or at least in such a way as to arrest the attention of the reader.

The descriptions of the different diseases are carefully written, and we are in full accord with the plan of classification, although we cannot agree that acromegaly finds its proper place under " Functional Diseases of the Nervous System." In reading the account of acromegaly we do not find any note of the occurrence of bitemporal hemianopsia, while "Congenital Heart Affections" receive a very inadequate description. There is a useful appendix, in which an excellent and practical account is given of the general care of the sick. We wish every success to the book, and trust that in future issues the inevitable increase of cost will not prevent the author from filling in the illustrations which we feel would so greatly add to the utility of what is a valuable addition to the medical book-shelf.

Human Physiology. By Professor LUIGI LUCIANI. Translated by FRANCES A. WELBY. In Four Volumes. Vol. II. Pp. 558. London: Macmillan & Co. 1913. Price 18s.

WE welcome the publication of the second volume of this admirable work. The Director of the Physiological Institute of the Royal University of Rome, Professor Luigi Luciani, is a physiologist of such distinction and eminence that one expects the high standard of excellence achieved in the first volume to be maintained in subsequent portions of the series. Volume II. more than fulfils this expectation. It deals with the internal secretions, the external digestive secretory processes, digestion and assimilation, the secretion and excretion of urine, and the functions of the skin and cutaneous glands. The various problems are discussed in a critical and judicial manner, and the growth of knowledge in each department is set forth in a fashion which brings clearly before the reader the way whereby our present-day opinions have been elaborated and matured. The text is thoroughly up to date in each section of the treatise, and presents the views of the learned writer in excellent idiomatic English. The volume is a further instalment of a work that should be in the hands of every one who is interested in the science of physiology.

Diseases of Women. By THOMAS G. STEVENS, M.D., F.R.C.S., M.R.C.P. Pp. 431. London: University of London Press, Ltd., by Hodder & Stoughton, and Henry Frowde. Price 15s.

DR STEVENS has compiled a valuable addition to the ever-increasing number of text-books for students. This volume is not too large, and yet contains all the essentials of gynæcology that a final year student and general practitioner should know. It is the result of the author's teaching and experience, and is therefore valuable for the practical hints scattered all through the book.

We cannot agree, however, with Dr Stevens' wholesale condemnation of the uterine sound. Its usefulness in diagnosis in difficult pelvic cases is completely ignored, and its dangers exaggerated to such an

extent that, in the author's opinion, it should be abolished except as a means of applying medicaments to the interior of the uterus.

There is an excellent chapter on the displacements of the pelvic organs, but it is to be regretted that rubber pessaries are advised for prolapse, without any mention of the vulcanite ring which is so much cleaner and less likely to cause irritation. Also in these days of surgery Aveling's repositor for inversion of the uterus might well be relegated to its proper place, a museum of antiquities, when one considers the dangers associated with its use and the excellent results obtained by operating from the abdomen. The statement that dysmenorrhœa with the backward displacements is not due to the position of the uterus at all, and is unrelieved by reposition, is too sweeping an assertion to be accepted as absolutely accurate.

The volume is profusely illustrated with excellent drawings, mainly from the author's own hand, and even more valuable are the photomicrographs, of which there are a considerable number.

Brain and Spinal Cord: A Manual for the Study of the Morphology and Fibrous Tracts of the Central Nervous System. By Dr. (Med.) EMIL VILLIGER, Privat-Dozent in Neurology and Neuropathology in the University of Basel. Translated by GEORGE A. PIERSOL, M.D., Sc.D., Professor of Anatomy in the University of Pennsylvania. From the Third German Edition. With 232 Illustrations. Pp. 289. Philadelphia and London: Lippincott Co. Price 16s.

THIS text-book is a valuable addition to the neurological library; indeed we know of no book upon the anatomy of the nervous system which should prove more useful both to the student of anatomical and clinical neurology. The book consists of three parts. Part I. contains an excellent description of the morphology of the brain and spinal cord. Part II. is, however, the unique feature of the book. In this section the individual nerve tracts are described and their connections graphically portrayed in numerous very striking diagrams. Part III. consists of some fifty plates representing a series of vertical transverse sections through the brain stem of a four year-old child. This chapter will be of the greatest value to the student, for it is only by a study of serial sections such as are here depicted that it is possible to obtain a vivid mental picture of the complex relations of this region of the brain. Finally, we can confidently predict that Dr. Villiger's book will meet with that popularity in this country which, in our opinion, it deserves.

Oxidations and Reductions in the Animal Body. By H. D. DAKIN, D.Sc., F.I.C. Pp. 135. London: Longmans, Green & Co. 1912. Price 4s.

BOTH the title and the contents of this monograph will come as a surprise to many. Most of us have been brought up on the broad

generalisation that the plant builds up complex substances from simple ones, while the animal organism breaks down complex substances into simple ones by a process of oxidation. The formation of non-nitrogenous substances, such as carbohydrates, from nitrogenous ones, such as proteins, is regarded as one of the paths along which this process of chemical disintegration may proceed : the reverse, a synthesis of nitrogenous substances from non-nitrogenous substances and ammonium salts, has been held to be a process of which the animal organism is incapable.

Since the beginning of this century a small band of workers, of which the author of this volume is one of the leaders, has attempted to trace step by step the chemical changes to which the complex chemical substances of the food are subjected in the body. The monograph before us gives a lucid and comprehensive account of what has been achieved in this field of biochemical research.

We see now how metabolism proceeds along the main highways in an even course downwards from the complex substances of the food to the simple ultimate end products such as carbonic acid and water. But leading away from them are numerous byways which may even turn back, so that in following them we may meet with processes of synthesis instead of processes of disintegration, and with processes of reduction instead of processes of oxidation. A combination of such processes enables the animal organism to build up amino-acids from carbohydrates.

These byways of metabolism acquire a special importance under pathological conditions when the traffic along the main roads is obstructed. In the diabetic organism, for instance, certain amino-acids give rise to glucose, while others lead to the formation of the so-called "acetone bodies." These acetone bodies may also be formed in diabetes from fatty acids, but only from fatty acids with an even number of carbon atoms, those with an uneven number having a tendency to inhibit the formation of acetone bodies from substances which would otherwise yield them.

These few facts are perhaps sufficient to indicate how full of interest this little volume is, both to the physiologist and to the clinician.

The Milk Question. By M. J. ROSENAU. Pp. 309. London : Constable & Co., Ltd. 1913. Price 7s. 6d.

THE milk question is recognised to-day, the world over, as being one of vital importance.

As Professor Rosenau says, "The final solution of the milk problem will require mutual co-operation between the farmer, the consumer, the middleman, the health officer, the transportation agent, and the legislator in order to achieve real constructive progress."

But the question is one which is intimately associated with the everyday work of all medical men. To those of them who have eyes

to see and time to think, the dangers to life and health of cows' milk appear great and serious. They are in a position to judge of those dangers—they have knowledge of the important facts relating to the question as it affects human life, they, as a body, have a responsibility towards the community ; and in this country they have so far failed to exercise their influence with the general public in the direction of solving the milk problem, which the gravity of the issue demands. It may be that they themselves still fail to grasp the seriousness of the position. In any case, so far as concerted action goes, they lag behind their professional brethren in various other countries, and especially in the United States.

This book sets forth the question clearly, and it is to be hoped that it may further stimulate medical men to ponder the question and act according to their convictions.

History of the Medical Teaching in Trinity College, Dublin, and of the School of Physic in Ireland. By T. PERCY C. KIRKPATRICK, M.D., M.R.I.A. Dublin : Hanna & Neale. 1912. Price 7s. 6d. THIS book bears out the statement that history is mainly a matter of biography. It is a running narrative of and commentary upon the events that make the history of the Dublin Medical School and the lives of those responsible for its management. The writer has therefore handled a great mass of dates, extracts from minutes, and quotations from letters, all of which he treats in a broad-minded fashion, and presents in a very attractive form. Doubtless it will surprise many, even of those specially interested in the development of medical schools, to learn that the teaching of medicine in Dublin is three centuries old, although the full School of Physic was not established till after the passing of an Act by the Irish Parliament in 1785. It is interesting to note in passing that arrangements were then made for augmenting the salaries of professors in the more purely medical subjects up to a sum not exceeding £100 each ! While matters like the founding of chairs and granting of charters are of interest mainly to the student of history and to the local antiquarian, the book is full of accounts of wrangles between professors and of disputes between Trinity College and the College of Physicians which seem to have been carried out with true Hibernian vigour, often with personal violence, and on one occasion at least leading to a fatal issue. These and similar touches like the story of how the body of Cornelius Macgrath, the Irish giant, was stolen by students after drugging the liquor at his wake give to the book a vital human interest and fascination which make it difficult to lay the volume down. Although this medical school made little stir in the outside world till well on in the nineteenth century, when it had names to show like those of Graves and Stokes, it seems ever since the days of Cullen to have maintained

a close connection with the Edinburgh school, and some of its best teachers were Edinburgh men.

Law for Medical Men. By Fred. J. Smith, M.D., F.R.C.P. Pp. xii. + 402. London: J. & A. Churchill. 1913. Price 10s. 6d. net.

Medicine touches social life in so many relations outside the comparatively simple one of doctor and patient that successive Parliaments in the course of their activities have framed innumerable statutes affecting, directly and indirectly, the calling of medicine. It is presumed that everyone knows the law: few, in fact, do so, and troubles may arise on that account. Guidance on the extra professional position and duties of medical men is often required, and it is afforded by a book such as this. Dr. Smith has, as it were, codified the law in its bearings on medicine, and by the aid of a complete index it is easy to refer to the statutes on any particular subject. To give an idea of the scope of the work we may enumerate some of the main divisions:—Acts relating to medical qualification, to certificates of births and deaths, to pharmacy, to midwifery, to vaccination; laws affecting children, lunatics, and drunkards; public health, factory, town planning, housing, trade diseases, and workmen's compensation Acts: criminal offences; poor law and other medical services; the Insurance Act. The general plan adopted is to set forth the relevant clauses of statutes, to explain their meaning, either as it appears or as it has been interpreted by the Courts. Special reference is made where necessary to differences resulting from Scots law and procedure and from Scottish legislation. Dr. Smith's book is a valuable work of reference: it must have entailed a great deal of labour, and he deserves the gratitude of the whole profession. It is, literally, one of those books which no doctor's library should be without.

NEW EDITIONS.

The Treatment of Disease in Children. By G. A. Sutherland, M.D., F.R.C.P. Second Edition. London: Henry Frowde, and Hodder & Stoughton. 1913. Price 10s. 6d.

We are glad to welcome the publication of a second edition of this useful little volume on the treatment of disease in children. In this edition much new material has been added, including chapters on specific fevers and diseases of the skin, whereby the value of the book as a work of reference is considerably enhanced. The volume is intended as a practical guide to the young practitioner, who will find in its perusal much sound advice and only well-tested methods of treatment. There is nothing either striking or original in the suggestions offered, the treatment recommended being that usually adopted by experienced physicians, but the rules laid down are clear,

precise, and unmistakable. The chapter on infant feeding is rather shorter than we would like to have seen it, but we agree with the author that the difficulties of feeding have been greatly over-estimated, and that laboratory milk possesses many disadvantages, and has utterly failed to establish its superiority over cows' milk as modified at home.

The treatment of congenital syphilis by salvarsan the author regards as yet in the experimental stage, and as there are certain risks in connection with its administration he reserves its use for cases which have proved intractable to mercurial treatment. In the treatment of tuberculosis by tuberculin he seems to prefer the administration of the drug by the mouth to the hypodermic injection, as he thinks that by the former method as definite a reaction is produced as by the latter. He considers, however, that the treatment of tuberculosis by tuberculin in medical cases is still *sub judice*

In discussing the treatment of scurvy he refers to the habit practised by many of the large dairy companies of supplying Pasteurised milk without any indication to the customer that it has been so treated. If the milk is again boiled on delivery its vital element reaches the child in a very attenuated condition, and is very liable to cause scurvy.

There is little in the book to criticise, it being the work of a man of wide experience and mature judgment, and we can heartily recommend it to anyone seeking guidance in the treatment of children's diseases.

Lectures on the Diseases of Children. By ROBERT HUTCHISON, M.D., F.R.C.P. Third Edition. Pp. xii. + 404. London: Edward Arnold. 1913. Price 10s. 6d. net.

THE third edition of this excellent manual has undergone thorough revision, and has been amplified by the addition of six new chapters. The page has been enlarged, and, although the bulk of the volume has increased considerably, it still remains of handy size. The fresh matter which has been incorporated has been judiciously selected to suit the needs of the student, and is presented in the same vivid, concise language which characterises the author's other writings. Coeliac disease, the term chosen by Dr. Hutchison to describe a fairly common though rather ill-defined group of cases characterised by chronic disorder of the bowels, leading in marked cases to infantilism, is a condition which deserves wider recognition than it has received, and we are glad that it has been included in these lectures. The remaining new chapters deal with respiratory diseases at greater length than formerly, with hysteria, with non-rheumatic heart diseases, and with genito-urinary affections. The book well merits its popularity, and in its now extended form is the best short manual of diseases of children we possess. A few fresh illustrations appear in this edition.

Diseases of the Liver, Gall-bladder, and Bile Ducts. By H. D. ROLLESTON,
    M.D., F.R.C.P. Second Edition. Pp. xv. + 811. London:
    Macmillan & Co. 1912. Price 25s. net.

THIS compendious treatise is a veritable mine of information on
diseases of the liver and biliary passages. No aspect of the subject,
however small, seems to have escaped the author's notice, and his
elaborate descriptions of the pathology and clinical signs of liver
disease, drawn from his own large experience and an exceptional
acquaintance with the literature, render the book invaluable for
study and for reference. This edition has undergone thorough revision,
and has had incorporated in it all the most recent work on the subject.
As an admirable feature we would especially draw attention to the
stress laid on morbid anatomy, a knowledge of which is of paramount
importance in connection with hepatic diseases. The field covered is
a large one, and in it lie some of the most difficult problems which
internal medicine has yet to solve. Dr. Rolleston states conflicting
hypotheses and the arguments *pro* and *con* clearly, and leaves the
reader in no doubt as to the view he holds on moot points. The
apportionment of space to the various diseases considered is good.
It is not possible in a short notice to describe, much less to criticise,
any of the interesting points raised : we must be content to say that
Dr. Rolleston's book is unquestionably a standard authority, and is a
model of what a treatise on a single department of medicine ought to
be. There is a very full index, and the illustrations, some of which
are in colour, are excellent.

Manual of Operative Surgery. By H. J. WARING, M.S., M.B., B.Sc.,
    F.R.C.S. Fourth Edition. Pp. 778. London : Henry Frowde,
    and Hodder & Stoughton. 1912. Price 12s. 6d.

THE appearance of a fourth edition of Mr. Waring's *Manual of Operative
Surgery* is evidence of the continued popularity of his work. In its
present form the book has been completely revised, and now covers
the whole field of operative surgery, with the exception of ophthalmic
operations and perineal operations in the female. A special feature
is the use of the new anatomical nomenclature throughout, a glossary
of the old and new terms being inserted for the use of those who have
not been educated in the new terminology. In the main Mr. Waring
has followed the conventional lines of text-books on operative surgery
for the use of students, and if his book differs from others of its class
it is in the direction of giving fuller and more detailed descriptions.
The account of each operation is practically complete in itself, a plan
which certainly on occasions saves the reader trouble, but necessarily
leads to a good deal of repetition in describing steps common to several
operations on the same organ. The sections on the surgery of the
stomach and kidney and ureter, for example, might perhaps have been

shortened with advantage by a little judicious condensation in the direction of avoiding repetition. A feature which seems also open to criticism is the plan of prefacing the account of an operation by a summary of the indications for its performance. Summaries of indications are almost necessarily imperfect on account of their brevity. A book on operative surgery should answer the question of how an operation is done, leaving the problems of when and why it is to be done for fuller treatment in a text-book dealing with surgery as a whole. While Mr. Waring's book would gain rather than lose in our opinion by condensation along the lines indicated, it may be commended, in the main, as a sound guide to students and those preparing for higher examinations. There are 541 illustrations, many of great value and assistance to the reader. On the other hand a number, such as those depicting glass bowls and tables, hand basins, nail cleaners, rubber bandages, and common instruments, might well be relegated to the pages of a surgical instrument maker's catalogue.

NOTES ON BOOKS.

THE sixth volume of the *Prescriber* (Edinburgh, the *Prescriber* Offices) for 1912 has been issued as a neatly bound book of 334 pages. As many of our readers doubtless know, this is one of the most useful of the smaller journals, and it gives, month by month, a synopsis of progress in therapeutics and pharmacy. As a guide to new remedies it is unexcelled, and we wish it all prosperity.

Mr. Leonard A. Bidwell's *Minor Surgery* (University of London Press, 1913, price 10s. 6d.), which has reached its second edition within a year, should prove of great value to medical students and to general practitioners. The subjects are dealt with in a concise and practical manner, and include descriptions of a great variety of minor surgical operations, such as come within the scope of the practitioner. Useful information is also given for guiding the physician in the preparation and arrangements necessary for major operations. A new chapter has been added on bandaging and on the treatment of minor injuries. The illustrations, although not elaborate, are clear and instructive.

Transactions of the American Laryngological Association, 1912. This volume is a record of the work of the thirty-fourth annual meeting of the above Society. It contains, in addition to the president's address and general business, 26 papers on a large variety of subjects. The general standard of the papers is a high one, and some of them are unusually interesting. We may mention specially Chevalier Jackson's article on " Anæsthesia for Peroral Endoscopy," and Greenfield, Shuder's, and Mosher's papers dealing with anatomical questions. The volume as a whole reflects great credit on the Society.

The series of monographs published under the auspices of the *Journal of Nervous and Mental Disease* has already received favourable notice in our columns. Several of the volumes are now out of print, and we welcome the re-issue of two of these—*Outlines of Psychiatry*, by William A. White, M.D. (fourth edition, price $3), and *Selected Papers on Hysteria*, by Professor Sigmund Freud (second edition, price $2.50 : New York, the Journal of Nervous and Mental Disease Publishing Co.). Both are works of real interest and value : the former is one of the best manuals of psychiatry with which we are acquainted, and the latter, admirably translated by Dr. Brill, gives an excellent first-hand *aperçu* of some of the leading features of Freud's teaching. The issue of these monographs is a real service to neurology and psychiatry.

BOOKS RECEIVED.

ABEL, R. A Laboratory Handbook of Bacteriology. Second Edition
(*Frowde, Hodder & Stoughton*) —
AUERBACH, S. Headache . . . . . . (*Frowde, Hodder & Stoughton*) 5s.
BERKELEY, C., and V. BONNEY. The Difficulties and Emergencies of Obstetric Practice
(*J. & A. Churchill*) 24s.
BERNSTEIN, R. Solidified Carbon-Dioxide . . . . . (*F. S. Betz. Hammond*) —
BIRT, M. S. Invalid and Convalescent Cookery. Second Edition . . (*Wright & Sons*) 6d.
BRAUN, A., and I. FRIESNER. The Labyrinth . . . . . (*Rebman, Ltd.*) 17s. 6d.
CHANTEMESSE, A., and A. COURCOUX. Les Pleurésies . . . . (*O. Doin, Paris*) 6 fr.
CHEYNE, W. W., and F. F. BURGHARD. A Manual of Surgical Treatment. Vol. IV. New
Edition . . . . (*Longmans, Green & Co.*) 21s.
COTAR, C. The Mineral Waters of Vichy . . . . . . (*H. K. Lewis*) —
DISEASES of Children. Edited by A. E. Garrod, F. E. Batten, and H. Thursfield
(*Edward Arnold*) 30s.
DUHRSSEN, A. Geburtshülfliches Vademekum . . . . (*S. Karger, Berlin*) 5.60 mk.
EVANS, Analytical Notes for 1912 . . . . (*New York*) —
FREUD, S. The Interpretation of Dreams . . . . . . (*Geo. Allen*) 15s.
GLYNN, E. The Study of Disease in the Domesticated Animals (*Liverpool University Press*) 1s.
HART, A. H. The Practitioner's Vade Mecum or How to Cut the Drug Bill. Third Edition
(*Bale, Sons, & Danielsson*) 2s. 6d.
HIRSCHMAN, L. J. Diseases of the Rectum. Second Edition . . . (*H. Kimpton*) 18s.
HITSCHMANN, E. Freud's Theories of the Neuroses
(*Journal of Nervous and Mental Disease Publishing Co.*) 2 dols.
JONES, H. L. Medical Electricity. Sixth Edition . . . . . (*H. K. Lewis*) 12s. 6d.
KRAEPELIN, E. General Paresis (*Journal of Nervous and Mental Disease Publishing Co.*) 3 dols.
MINETT, E. P. Diagnosis of Bacteria and Blood-Parasites. Second Edition
(*Baillière, Tindall & Cox*) 2s. 6d.
PROUT, W. T. Elementary Hygiene and Sanitation. Third Edition (*J. & A. Churchill*) 2s. 6d.
RIVIERE, C., and E. MORLAND. Tuberculin Treatment. Second Edition
(*Frowde, Hodder & Stoughton*) 6s.
SAUNDBY, R. Old Age: Its Care and Treatment in Health and Disease (*Edward Arnold*) 7s. 6d.
SURGERY: Its Principles and Practice. Vol. VI. Edited by W. W. Keen
(*W. B. Saunders Co.*) 30s.
TEXT-BOOK of General Pathology. Edited by M. S. Pembrey and J. Ritchie
(*Edward Arnold*) 18s.
THE Medical Who's Who, 1913 . . . . (*London and Counties Press Association*) 10s. 6d.
THE Surgical Clinics of John B. Murphy, M.D. 1913. Vol. II., No. 1 (*W. B. Saunders Co.*) —
TRANSACTIONS of the American Association of Genito-Urinary Surgeons, 1912. Vol. VII.
(*New York*) —

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES.

Reorganisation of the Teaching of Pathology and Clinical Medicine.

WHEN, last year, the Chair of Pathology became vacant, it was apparent that the University was faced by the problem of making fresh arrangements for the teaching of three distinct subjects —pathology, bacteriology, and clinical medicine. The decision to create new Chairs of Bacteriology and Clinical Medicine is the first step towards a reorganisation of the teaching of medicine, but to ensure that the reorganisation will be effective it is essential that the work of the three offices should be looked at as a whole, and that there should be no idea of splitting it by water-tight bulkheads.

It is generally understood that in the future the Professor of Pathology will hold the position to which he is entitled in his proper department of the Infirmary, and, as we anticipated, it has been possible to effect this change in his status without detriment to (indeed, rather greatly to the advantage of) the existing staff who will come under the aegis of the University. Thus is initiated for the first time in connection with the chair a pathological institute in the proper sense—a department for teaching, for research, in close proximity to and in intimate relation with the wards of the Royal Infirmary. An obvious further step towards centralisation and efficiency is for the pathological departments of other hospitals to come into close touch with the institute. Both parties would gain by the bargain—the institute through the material to which it would gain access, the hospitals by having opened to them facilities for investigation which they could never afford to provide from their own resources, so costly has equipment become.

Now that the University is to have a Chair of Bacteriology, there can be little doubt that the Managers of the Infirmary will give the professor a place on its staff. In the present state of science, bacteriology is even more directly a servant of clinical medicine and therapeutics than its elder sister pathology. In the interest of the patients, above all, it is eminently desirable that it should be utilised to the

utmost in diagnosis and treatment. The only way in which this object can be fully attained is by making the bacteriologist a colleague of the clinician, and giving him accommodation alongside the pathologist in the pathological institute. In any case, the anomaly which existed so long in connection with the pathological chair—the severance of the professor from the pathological department of the Infirmary—is at all costs to be avoided.

In very intimate relation to the pathological and bacteriological sides of the institute will stand the department of clinical medicine, for certainly the clinical professorship will carry with it more than a mere name. Of late a new problem has arisen in connection with university teaching of clinical subjects, viz. in how far the professor should be a teacher and investigator pure and simple, and in how far he should be allowed to practise privately. In Edinburgh this difficulty hardly calls so pressingly for immediate solution as in some other schools, because here teaching is by tradition a duty, not a mere incident in the day's work. The question appears, however, to have been in the minds of the framers of the new ordinance, for provision is there made for increasing the salary attached to the chair. The matter has recently been very fully thrashed out in the *Final Report of the Royal Commission on University Education in London*, and the conclusion laid down therein, that professors of clinical medicine should devote the greater part of their time to teaching and research, and should be remunerated accordingly, will undoubtedly carry great weight in the future. The part of the *Report* dealing with clinical medicine is, however, of too great importance to be dealt with as a side issue, and we postpone reference to it at this time. Apart from the conditions of tenure, what is necessary to make a chair of clinical medicine a reality? The holder, like other University professors, must have absolute control of adequate material, both in the wards and in an out-patient clinic; he must have a sufficient number of salaried assistants capable of specialising in different lines of research, and to whom he can delegate a considerable amount of teaching; he must also have thoroughly equipped laboratories. In other words, we have now-a-days to conceive of a clinical professor as we conceive of a physiologist or pathologist—as a man whose energies are primarily educational, directed towards the treatment of patients in a public institution, towards research, and towards teaching, and whose duties towards private individuals as patients are necessarily restricted to a corresponding degree.

The changes which are coming in Edinburgh are all in the direction of concentration under the wing of the University, and in the direction of abolishing that internal competition on which the school has hitherto flourished. These changes result from force of circumstances, mainly two—competition from outside schools, and the increasing

costliness of educational plant. From analogous causes the same process is occurring in the industrial world, in the formation of trusts and rings for the abolition of internal competition, and the concentration and better utilisation of resources. To realise this is to consider how the inevitable transition period may be passed through without injuring the true interests of the extra-mural teachers who have done so much for the school in the past, and to whom it still looks for strength and support.

Another body—the Managers of the Infirmary—are vitally concerned in any reorganisation of the teaching, and without their cordial sanction success is impossible. We refer, of course, to the question of appointments to the staff, a matter which rests entirely in the hands of the Managers, although the University is of necessity a deeply interested party. The welfare of the Infirmary is so interwoven with the efficiency of the medical school, that friction between two bodies with a common aim is hardly probable, but a means of preventing misunderstanding would be the appointment by the Managers of a selection committee, which (after consultation with the University or other teaching body) would recommend a candidate to the full Board, in whose hands the ultimate decision, since theirs is the responsibility, must lie

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The Insanity of Genius. THE fact that the late Mr. J. F. Nisbet's book on *The Insanity of Genius** has reached a sixth edition is sufficient of itself to show that the subject with which it deals still has a fascination for the general reader. One need not wonder at this, for there is a perennial interest in studying the life history of a great man or a great woman, especially when the study is rewarded (or followed, shall we say) by the discovery of the existence in him or her of unsuspected flaws, of a surprising dereliction or a mysterious delinquency, of a curious peccadillo or a quaint idiosyncrasy. The ordinary man, who is no genius and who knows it, feels that after all there is some compensation for mediocrity in its escape from the troublesome impedimenta which seem to hamper the progress of the abnormally brilliant or learned or skilful man through life. There are two things, however, which it is well to keep prominently in view in reading and thinking upon such books as Mr. Nisbet's. One is that all men of genius are not insane. If the life history of the ordinary man were submitted to the same searching light of investigation which has been given to that of his highly gifted fellow, it is almost certain that peculiarities, tricks of manner, and obliquities of conduct

would be found in it of an equally startling nature, and yet no one would suspect insanity in his case. The other is that geniuses in the past have often sprung from stocks which eugenics would unquestionably condemn as unsuitable for the purpose of continuing and improving the race. In other words, genius has in it a something which marks it off from insanity, and enough is not yet known of the causes of genius (or of the absence of it) to warrant anything more than the most tentative of legislative enactments for race-betterment.

Indian Students in Edinburgh.

WHETHER it is advisable for Indian students to come to this country to study is a matter upon which there will probably be considerable difference of opinion. India supplies efficient educational facilities in certain branches of knowledge : in others the facilities are most inadequate. Coming, as the young Indians do, either from preference or because they must, it is clearly the duty of authorities to supply them with the necessary information regarding courses of study, entrance examinations, etc. To this end committees have been formed in the various large centres in India with a view to advising students on the spot as to suitable centres for study and as to the qualifications necessary for entrance examinations to educational institutions in this country. Numbers of students come to this country, nevertheless, with very insufficient information as to matters relating to their studies here. With a view to helping students and assisting the work of the Advisory Committees in India, the Secretary of State for India has established a secretary for Indian students, with local advisers, to assist him in London, Oxford, Cambridge, Manchester, Edinburgh, and Glasgow. In addition, there is in London a bureau at 21 Cromwell Road, South Kensington, the headquarters of Mr. T. W. Arnold, C.I.E., the Educational Adviser in London, which acts as a centre and meeting place for Indian students.

These various officers are under the general direction of Mr. C. E. Mallet, the Secretary for Indian Students at the India Office, who acts as the channel of communication between them and the Advisory Committees, and other official authorities in India. In the case of students whose parents desire it, the India Office undertakes, on certain conditions, the responsibility of guardianship. This responsibility is delegated to the local representatives where such exists.

To the post of local representative in Edinburgh, the India Office have, in conjunction with the University authorities, recently appointed Dr. James Miller. There are some 230 Indian students in Edinburgh ; of these nine are under guardianship.

THE movement to establish a Nursing Home in Edinburgh for patients who do not desire to be treated gratuitously in a public hospital, and who are not in a position to meet the expense of a private nursing home, has now matured, and on 21st May the new Home was opened by Lord Balfour of Burleigh. The Committee of Organisation is to be congratulated on the success which has attended their work. A handsome hospital has been formed in Chalmers Street, and has been fully equipped with all that is necessary for the treatment of medical and surgical cases. A feature of the Home is that there is no fixed staff, each patient being treated by the doctor, and, if necessary, by the surgeon, of his own choice.

So far as we are aware this is the first Nursing Home of its kind to be established in this country, and the results of the experiment will be watched with much interest. The subscribers have ensured that the Home is started practically free of debt, and it is confidently anticipated that henceforth it will be self-supporting. The fees range from one to three guineas a week. Any movement calculated to foster a spirit of independence deserves every encouragement, and we wish this pioneer venture all success.

THE Annual Meeting of "The Edinburgh Medical Journal" Limited was held in May, when the Directors were again able to submit a highly satisfactory report to the shareholders.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The following gentlemen, having passed the requisite examinations, have been admitted Fellows of the College: Fergus Armstrong, M.D.(Edin.), Ecclefechan; Charles Botterill Baxter, M.B., Ch.B.(Edin.), M.R.C.S.(Eng.), L.R.C.P.(Lond.), Reading; George Noel Braham, L.R.C.S., Southampton; Rex Carrington Brewster, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Edinburgh; Henry Anstey Cookson, M.B., Ch.B.(Edin.), Cheltenham; Frank Holt Diggle, M.B., Ch.B (Vict. Univ., Manc.), M.R.C.S.(Eng.), L.R.C.P.(Lond.), Manchester; Keith Buchanan MacGlashan, M.D.(Edin.), Edinburgh; Frank Gerald Ralphs, M.B., Ch.B.(Vict. Univ., Manc.), Cheshire; Francis Arthur Scannell, M.B., Ch.B. (Univ. N. Zeal.), Timaru, New Zealand; Ralph Leicester Scott, M.B., Ch.B. (Edin.), Edinburgh; Alexander Dron Stewart, M.B., Ch.B (Edin.), Capt. Indian Medical Service; and Arthur Charles Thomson, M.B., Ch.B.(Univ. N. Zeal.), Edinburgh.

The Bathgate Memorial Prize in Materia Medica was awarded, after examination, to George Thomson Mowat, 10 Marchmont Crescent, Edinburgh

THE OUTWARD PROJECTION OF RETINAL IMAGES AND ITS BEARING ON SHOOTING.

By GEO. A. BERRY, LL.D., F.R.C.S.(Edin.),
Consulting Ophthalmic Surgeon, Royal Infirmary, Edinburgh.

THE projection externally of retinal impressions is the same, whether these impressions are produced in the ordinary way by the images of external objects, or by any other stimulus capable of giving rise to a visual impression. Projection takes place, for the stimulation of any part of the retina, in the direction of the straight line joining that part with the nodal point of the eye. The consequence of this is, that there is always the same angular relationship between the line of projection of a foveal image and the projection line for any one particular part of the retina. The projection of the field of vision is always the same therefore in respect to the projection of the line of direct fixation.

The projection of the line of fixation, and therefore of the field of vision as a whole, is, however, not always the same. One law governing projection is that, whatever be the relative positions of the eyes as regards an object fixed, the foveal impressions of each eye are projected so as to be superimposed. Another is, that the projection of the field of vision takes place normally in accordance, not with the actual movements which the eyes make in response to contraction of their muscles, but with the degree of innervation which is called for to elicit the movements. So far as the eyes are concerned there is no true *muscular sense*, but on the other hand an extremely delicate *innervation sense*.

An illustration of the superimposing of foveal images is seen in the blending of the images presented to each eye in a stereoscope. A simple way of demonstrating the same law is to hold a screen, with a circular aperture cut in it of half an inch or more in diameter, at a distance of 12 to 18 inches from the eyes. With the eyes converged on the centre of this aperture, notice is taken of the distant objects which are seen through it. The view taken in through the aperture by the one eye is observed to be mixed up with that seen by the other eye. If both views are sufficiently similar they will be blended into one. The apparent direction of the superimposed or blended images is in a line with the aperture and a point midway between the eyes, and therefore also midway between that of each of the objects as seen by one eye alone. What occurs is represented in Fig. 1, in which R*r* and L*l* are

the separate lines of projection of the right and left images respectively, while the arrow shows the line along which the images of the two eyes, when superimposed or blended, are projected.

If, again, we look at a distant object through two smaller apertures in the screen, separated from each other by a distance equal to that between the centres of rotation of the two eyes (60 to 64 mm. on the average), the effect produced is that of looking through one aperture which lies midway between the two. This is represented in Fig. 2. The lettering is the same as in Fig. 1. The arrow shows the line of projection through the apparent single aperture at *c*.
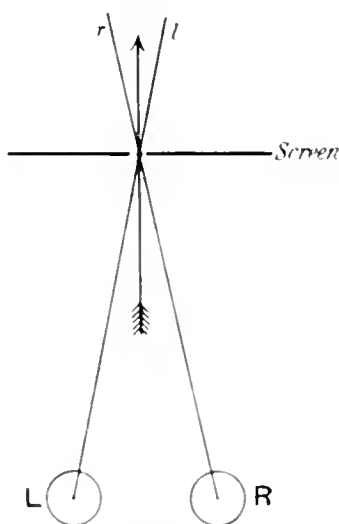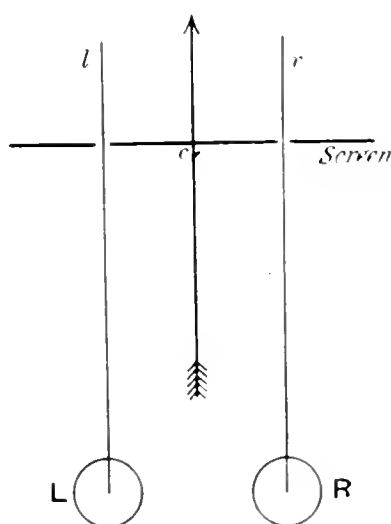
FIG. 1.   FIG. 2.

Projection with one eye alone is therefore different from binocular projection. Uniocular projection is, in fact, much simpler. Under normal conditions objects fixed are seen along the line which passes from them to their foveal images, *i.e.* they are seen in their correct position. There may, however, be a different or a "faulty" projection as the result of any interference with the normal muscular response to an innervation. In this is seen the influence of the other law of projection, by which it is dependent upon the innervation sense. This can be shown by mechanically interfering with the movement of the eye. For instance, the action of the internus muscle may be limited by putting the conjunctiva on the stretch by pinching up the skin at the outer canthus. Or the outward rotation may be checked by pressing a finger against the globe in the same situation. In either case projection takes place further in the direction of action of the impeded muscle than corresponds to the actual position of

the eye. This is easily seen by quickly pointing in the direction which appears to be that of the object looked at. The finger or stick used for this purpose will be found to be off the line as seen correctly by the eye when freed.

The influence of the innervation sense in this connection is exemplified also in the "faulty projection" which invariably accompanies an oculo-motor paresis, and often adds greatly to the discomfort which the paresis produces. Here, however, we find that the habit to which the existence hitherto of a normal response to any definite innervational effort has led, viz. correct projection, may be lost. When a paresis has continued for a long time projection becomes less dependent upon the innervation sense and more in accordance with the altered conditions. A test made in such a case to ascertain the nature of the projection shows it to be no longer faulty, and if diplopia can be elicited it is also no longer in accord with the relative positions of the two eyes.

But apart from the influence of the habitual delicacy of the innervation sense which pathological conditions of the oculo-motor muscle render evident, the same influence may have an effect on projection under normal conditions of motility. This is the case for binocular projection whenever convergence comes into play. If, for instance, a distant object is sighted with the one eye through a circular aperture of $\frac{1}{2}$-inch diameter in a screen, as described at page 486, and the two eyes are then converged on the aperture, the distant object makes an apparent movement to the side of the fixing eye although it is still only seen with that eye, whose line of fixation has remained unaltered.

If the right be the sighting eye, the apparent movement takes place to the right, and the original line of projection is immediately restored by an apparent movement to the left of the same extent as soon as the convergence is released. The opposite is the case if it is the left eye which sights. Fig. 3 represents the course of events when the distant object is fixed by the right eye. When after sighting the object correctly along the line R*r*, and therefore projecting its image along the same line, the plane of the screen is focussed for, the axis of the left eye, which was previously parallel to that of the right, is directed so as to meet that of the left eye at the middle of the aperture. In consequence of the law of equal distribution of stimuli over the two eyes the lateral muscles of the right eye are now otherwise innervated although its line of fixation has remained unaltered.

It is innervated, in the first place, to convergence along with the left eye. This, if responded to, would have carried the right line of vision to the left to meet the left line of vision at A, a point for which their deviation from the position assumed for distant fixation is equal, and for which their angular convergence is the same as for the centre of the aperture in the screen. No active response by the right eye does, however, take place to this innervation, because at the same time it receives, in the second place, an innervation which would bring it back again, along with the associated further rotation of the left eye to the right, to the position in which both lines of vision meet at the centre of the aperture in the screen. Whilst, therefore, the left eye moves to the right, in response to the double innervation to convergence
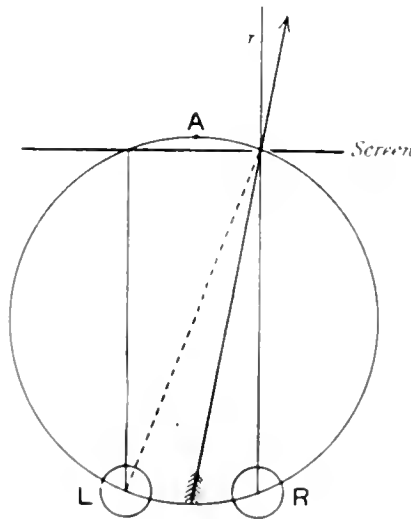
FIG. 3.

and associated right rotation, the right eye retains its original line of fixation, in response to the same innervational demands, which, in its case, are in degree and direction such as mutually to neutralise each other. But though there has been no movement in the right eye, the sense of innervation gives rise to an impression that the object has moved to the right into a position which would be occupied by an object situated as much to the right of the object actually fixed as would correspond to the degree of rotation to the right which the unimpeded response to the innervation to lateral movement would habitually have produced. Although, therefore, the distant object is not seen by the left eye at all, being cut off from it by the screen, it appears in a wrong position.

The apparent movement to the right, which results from the unconscious belief that the eye is otherwise deviated than is

actually the case, is not materially modified by the innervation sense resulting from the simultaneous impulse that the right eye has to move to the left. This impulse being associated with an equal impulse to inward rotation of the other eye, only causes a change in the impression given as to the distance of the object, that is, not a lateral change, but a change in depth. This may be called the *convergence innervation sense*. The apparent change in depth is not so noticeable as the apparent lateral change in projection, because the impression got is generally counteracted by the knowledge of the approximate distance of objects.

The binocular faulty projection just described, though more easily observed when the one eye is screened from the distant object fixed, can readily be observed without the screen, even when both eyes are kept open. Under these circumstances it is complicated by the doubling of the distant object, when a nearer one, held in line with it and one eye, is converged upon. The image falling on the retina of the eye, the axis of which is not in line with the distant object, is a more or less eccentric one, and may not attract attention. Many people do not readily notice double images which occur under such physiological conditions. Attention is mainly paid to the image received by one eye alone, which is thus in a sense the preponderating eye, while the image got by the other eye is more or less completely suppressed.

It is easy to determine which, in any particular case, is the preponderating eye, by making use of the screen and aperture used in the previous experiments. The individual to be tested is asked to hold the screen in front of him with both eyes open in such a way as to look at a distant object through the opening. He will at once do so by bringing the opening and distant object in a line with his preponderating eye. In doing so, he may or may not be conscious of the doubling of the aperture which comes from the axes of the eyes being parallel instead of converged on the plane of the screen. In many cases attention given to the distant object is sufficient to prevent the eccentric image of the aperture in the non-fixing eye from being observed. If the object looked at be a single light in surrounding darkness, and the surface of the screen next the observer also feebly illuminated, comparatively few are conscious of seeing double.

Both what may be called binocular faulty projection and the preponderance of one eye have a bearing upon shooting. As in rifle shooting the aiming is done deliberately with one eye only brought into line with the sights on the barrel and the object

aimed at, there is no tendency to project in any but a correct way. It is otherwise, however, in the case of shooting with a sporting gun. Here a complicated co-ordination of muscular action has to be acquired in order to bring the barrel of the gun quickly into line with the object aimed at. The line of the barrel and the line of correct projection from the object to a point midway between the eyes have practically to coincide. Actual coincidence of these two lines is not necessary, even were it possible. But the line of the barrel must lie along the junction of two planes which are parallel to, and close to, the planes in which the projection line lies.

As regards elevation, binocular vision does not in any way normally cause a difference between the real and apparent height of the object aimed at. Any difficulty that there may be of maintaining the right elevation, after proper co-ordination in aiming along the line of projection has been acquired, is due to causes which are independent of vision. On the other hand, to bring the gun into parallelism with the correct directional line may evidently be frustrated by a faulty projection. If projection is correct it does not matter whether it is the right or the left eye which preponderates, nor whether aim is taken from the right or the left shoulder. Indeed, with correct projection, it may not even be necessary to bring the gun to the shoulder at all; the acquired co-ordination between aiming and projection may be sufficiently delicate to admit of an accurate aim from any level of the body.

On the other hand, if the projection be faulty, owing to a convergence on the end of the barrel just when taking aim, the aim will be wrong whichever be the " master eye." At the same time the deviation will be greatest when the left is the master eye when shooting from the right shoulder, or the right the master eye when shooting from the left shoulder. The master eye is therefore only of any consequence at all when a wrong method of shooting is adopted. Even then it only somewhat exaggerates a defect, which in any case exists when the sporting gun is aimed as one would aim with a rifle, and not pointed, with both eyes open and fixed on the object aimed at, as it should be. That is the only way indeed in which it is possible to learn to shoot well, just as in throwing a stone at any object it is the object one looks at, not the hand which throws the stone. The same applies to billiards, which is played with both eyes open, and directed, not at the cue ball, but at the ball which it is to be made to strike.

The proper alignment of the cue is then acquired by a m co-ordination which is in accordance with the correct projection. There are many other sports, of course—bowling and curling for instance—for which the same holds good.

The fact that there is always a more or less preponderating or "master eye" has given rise to a very general tendency to exaggerate its importance. It has been exploited by gunmakers for all it is worth, and has led to the erroneous practice of providing a gun with a "set off" whereby the barrel comes to be more nearly in line with the master eye when it is fired from the non-corresponding shoulder. This mistaken idea and wrong cure for bad shooting tends, unfortunately, to be perpetuated, no doubt, too, altogether apart from any advantage which belief in it may be to the gunmaker, on account of the fact that, in not a few cases, the change to a gun with a set off may improve one's shooting, at all events for a time. Not unnaturally, therefore, the treatment that seems to produce a cure is believed to be sound in principle. In this case, knowing the principle to be wrong, I venture to offer another explanation for the success of the treatment, though success is neither invariable nor permanent. Every medical man knows how much suggestion has to do with the effect of any treatment. It might seem at first sight a little far fetched to assert that suggestion applied to the case under consideration, yet when suggestion takes the form of giving greater confidence it will be admitted that there is a possibility that from this cause there is an advantage to be gained.

Confidence alone may then partly account for the improvement experienced in shooting with a gun which is made ostensibly to counteract the fault wrongly attributed to the existence of the master eye. Loss of confidence, on the other hand, explains the relapse which subsequently, not uncommonly, takes place. But there is another and I believe more important element, making for the success which may attend the change of gun. It will often happen that the new gun is altogether better suited to the purchaser; it comes more easily to the shoulder, or the barrel and stock meet at an angle which may be better adapted to the particular individual. All this the expert gunmaker takes care to see to, and this of itself will make for better shooting. A better fitting gun and greater confidence in shooting with it are sufficient factors to account for improvement when it does take place. Its supposed adaptation to the master eye is of no direct effect.

From what has preceded it will be clear that, apart from sufficiently good acuteness of vision, straight shooting, so far as it depends upon the eye, only calls for correct, *i.e.* normal, projection. As one is constantly being consulted regarding shooting, I propose in conclusion to indicate shortly the kind of advice that I have always been in the habit of giving.

In the first place it must be remembered that everyone cannot be a first-rate shot any more than a first-rate cricketer. Even a first-rate shot, too, does not always shoot equally well; and this is, of course, still more the case in the less practised or less proficient. If one is physically or mentally fatigued or blown, although there is no fundamental fault in one's shooting, it may not be sufficiently quick to admit of its coming up to its normal standard. All this has nothing to do with the eye, although the eye is apt to be blamed for it. It may have to do with want of confidence; it certainly has to do with reduced alertness of muscular co-ordination. This has sometimes to be explained. A practised shot generally surmises it himself.

When anyone has got the idea that his bad shooting is to be ascribed to the effect of his master eye, he must, in the first place, be disabused of that idea, and not advised to resort to a "set off," or even, generally speaking, to take to shooting from the shoulder corresponding to his master eye. He must not be told to shut one eye when shooting, but to keep both eyes open. Only in this way, and by looking at the object, and the centre of the object, at which he is shooting, can he ever expect to be even a fair shot. This fact is most important to impress upon a boy who is learning to shoot. In others, if this correct way of shooting has not been acquired, the habit of taking aim must be given up. Opportunities of finding out what is wrong, *i.e.* whether the line of fire is too much to the left, or too much to the right, or too high, or too low, which some gunmakers can offer, should be taken advantage of. Further, different guns should be tried, and the one which suits best when shooting in the proper way selected. The rest is a matter of practice.

A METHOD OF TREATING UMBILICAL HERNIA.

By J. HOGARTH PRINGLE, M.B., F.R.C.S. Eng.,
Surgeon at the Royal Infirmary, Glasgow.

ALTHOUGH the operative treatment of inguinal and femoral hernia has during the past two decades been one of the most successful procedures in surgery, the after-results of several methods

of operation leaving nothing to be desired, the treatment of umbilical hernia, at least in the adult, can scarcely, as it seems to me, be placed in the same category.

The umbilical hernia of children is readily cured, but in the adult a real cure does not always follow operation, and there are various causes for the failures. Nearly all the patients suffer from excessive corpulence; most of them are females with lax pendulous abdominal walls, the result of frequent pregnancies. As a result of the laxity of the abdominal wall and the excessive deposit of fat in the omentum and mesenteries the two recti muscles gradually become forced further and further apart, and lose, to a large extent, their function of supporting the intra-abdominal contents, in consequence partly of their altered position and to some extent as a result of the fatty infiltration which occurs in their substance.

Many of the patients suffer from chronic bronchitis and heart states. The anæsthetic and the recumbent position necessary in the early post-operative period are frequently responsible for the increased coughing efforts which put strain upon the recently restored abdominal wall, the tissues of which, in consequence of the defective circulation, have not the same active powers of repair possessed by more healthy tissues.

The types of operative methods generally employed may be stated to be three in number.

1. A method, the originator of which I regret to say is unknown to me, which consists in the vertical splitting of the sheaths of the recti muscles along the margin of the ring and the suturing, vertically and in layers, of (*a*) the peritoneum and the posterior layer of the sheath, (*b*) the inner margins of the recti, and (*c*) the anterior layer of the rectal sheaths.

2. Transverse suture of the ring (Kocher).

3. Transverse suture with overlapping of the margins of the ring (Mayo).

I have employed the first of these methods frequently, and have found that in children, and in adults with no excess of fat and no wide separation of the recti, it does admirably, but that in those adults with heavy flabby abdominal walls and wide separation of fattily infiltrated recti muscles it is sometimes impossible by this manœuvre to approximate the recti, and if one trusts to this method alone some of these patients will suffer from relapse after a shorter or longer period.

I have tried Kocher's method in one or two instances, and
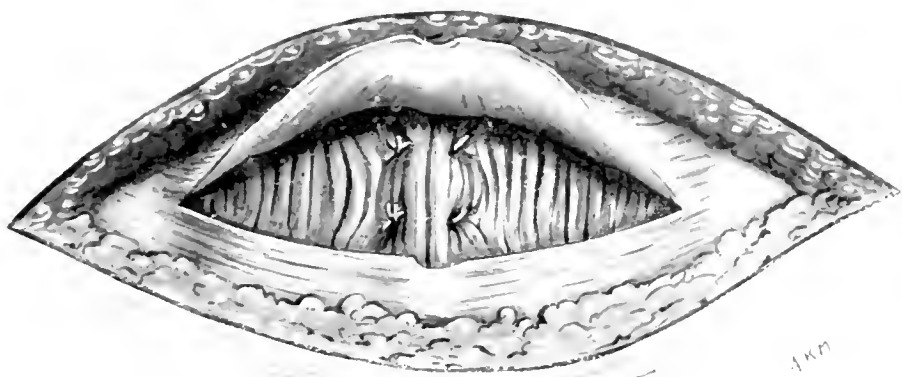
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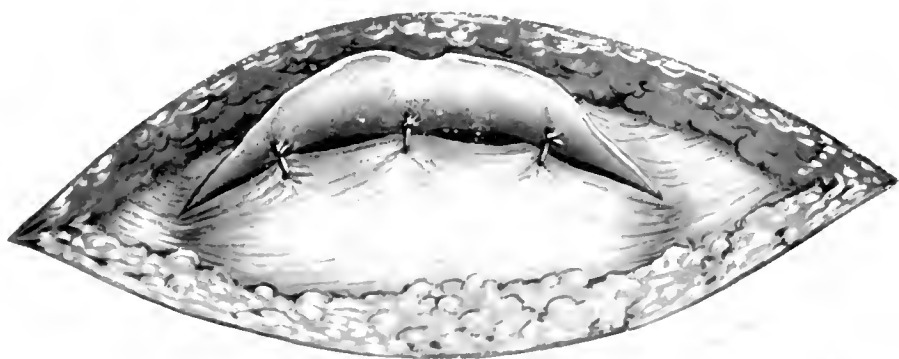
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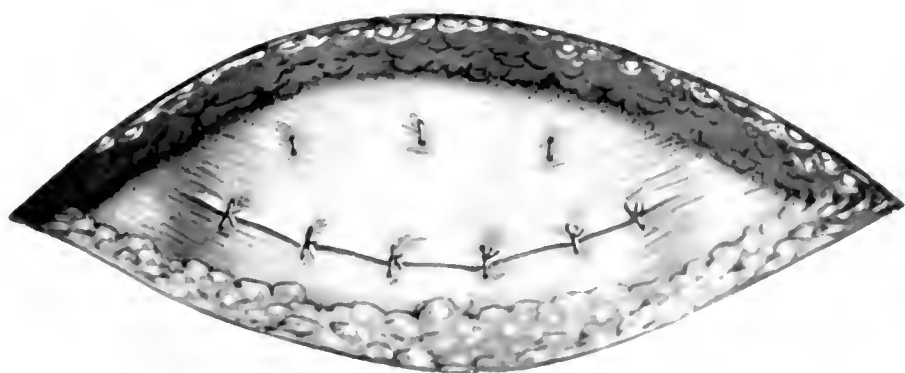
consider it most unsatisfactory, and I have been disappointed in the results after Mayo's method of overlapping the margins of the ring.

I found, that by dividing the anterior layer of the sheath of the recti in a transverse direction, after the return of the contents of the sac and the complete removal of the latter, in addition to splitting the sheaths vertically along the inner margin of the ring, it was a much easier matter to reach the internal border of each rectus, and much easier to get these muscles approximated, and by stages I have come to carry out the following procedure, which I consider a modified combination of the splitting and Mayo's methods, and I venture to think it is a decided improvement upon both:—

It is somewhat rash nowadays to dub anything in surgery "new," but I am not aware of any operation of the same nature having been proposed. The procedure constitutes an extensive operation; a very large wound is produced, and a long time is required to carry it out. I believe it takes me from $1\frac{1}{2}$ to 2 hours to complete the operation.

I began to do this four years ago, and have operated so far upon eight patients.

A large elliptical area of skin and subcutaneous fat, including the thin skin covering the hernia, is removed. This is merely an extension of the incision employed by many surgeons, I fancy, to remove the skin over the prominence of these herniæ. The vertical breadth of skin and fat which is to be removed is gauged by holding up the abdominal wall until the large suprapubic fold of tissue, present in all these patients, disappears: the transverse extent of the wound is anything from 10 to 16 inches. Fig. 1 shows the incision.

The removal of this elliptical area is generally commenced from below, and the subcutaneous fat must be removed fairly cleanly from the underlying sheath. The sac is opened close to the ring, all its loculi are emptied of their contents, which are returned into the abdomen, and the whole sac is removed.

A transverse incision is then made from each lateral margin of the ring to the outer limit of each rectal sheath (Fig. 2), and the two portions above and below this incision are dissected as two flaps off the anterior surface of the two recti muscles, the one upwards, the other downwards, the tissues of the stretched linea alba being split horizontally, so as to maintain the halves of the two sheaths in continuity with each other (Fig. 3). This dis-

section of the two sheath flaps is to be made upwards and downwards sufficiently far to permit easy approximation of the inner borders of the two recti for the whole distance in which they are exposed.

One, two, or three mattress sutures, according to requirements, taking a wide grip, are passed through the two recti and the posterior layer of the sheath and the peritoneum. These are drawn tight enough to approximate the two muscles, but before they are tied the now bunched up posterior sheath and peritoneum, as well as the margins of the opening "ring" through these structures, are sutured in a vertical mesial line; the mattress sutures are now tied (Fig. 4), and then the two adjacent margins of the recti are also sutured.

A series of sutures is next placed to carry and fix the cut border of the inferior flap, made from the anterior sheath of the rectus, as high up behind the upper flap as possible (Fig. 5); and then the cut border of the upper flap is sutured over and in front of the inferior flap (Fig. 6) as far down as it will come, so that good and wide overlapping is obtained.

The margins of the superficial wound are now approximated. If drainage should be considered necessary it may be from either angle of the wound or through a stab wound in the tissues of the abdominal wall just above the pubis. The patients whom I have treated in this way have all done well; in spite of the free dissection and manipulation of the rectus sheath the flaps formed from it have not suffered in their vitality at all.

I have seen all of the patients except one—and she writes that she is very well—during the last three months, and in none of them is there any sign of yielding of the abdominal wall, while their figures have been greatly improved by the removal of the excess of skin and fat, a matter of considerable satisfaction to themselves.

ON THE PRESSURE EXPERIENCED BY THE FŒTUS *IN UTERO* DURING PREGNANCY; WITH SPECIAL REFERENCE TO ACHONDROPLASIA (CHONDRODYSTROPHIA FŒTALIS).

By D. BERRY HART, M.D., F.R.C.P.

In a special monograph,[1] and also in the *Journal of Anatomy and Physiology*,[2] Dr. Murk Jansen has taken up the question of achondroplasia and advanced as an explanation of this deformed condition a theory of its causation by extra local pressure from

the amniotic fluid or extra tension by the amnion on the organ *
of the body shortened.

This raises the question of what pressure the fœtus *in utero* is
subjected to, and I therefore purpose considering this before dis-
cussing the validity of Dr. Jansen's views.

The fœtus *in utero* is not only pressed on by the liquor amnii
but also by the general intra-abdominal pressure. The uterine
wall is not rigid but moulded to the fœtus and liquor amnii in the
uterus. This is well shown in frozen sections of pregnancy by
Waldeyer.[3] Braune,[4] and others. Thus in a coronal section of a four
months' pregnancy the fœtus is in a transverse or sitting posture,
and the uterine wall is not rounded or oval but moulded to the fœtal
attitude. In a frozen section I made of a pregnant Macaque monkey
a plaster cast of the inside of the uterus gave a replica of the fœtus
with the interstices of the actual fœtus filled in by liquor amnii,
which, however, did not conceal the real attitude, but covered it
like a thin layer of jelly.[5]

Then, again, in a full-time human pregnancy of a breech
presentation in sagittal mesial section, Waldeyer drew attention
to the fact that the intestinal coils had indented the outline of
the internal uterine surface, as was shown by the small eminences
projecting into its cavity.

We must therefore regard the pressure on the fœtus *in utero*
as not merely one of the liquor amnii but of the intra-abdominal
contents, and the occasional increase of such pressure due to the
muscular action of the abdominal muscles and diaphragm.

If that be the case such pressure on the fœtus must be uniform
and equable. We cannot say that at any point in the periphery
of the embryo there is extra pressure, as the result of this would
be motion until equilibrium was restored. Even if such local
pressure were permitted there is no evidence that it would hinder
vital growth, and indeed all such mechanical ideas in vital
processes are receding into the background as our knowledge
increases.

In achondroplasia we have practically a short-legged, short-
armed individual with deficient development of the ossa innominata
and of the basis cranii, and with sometimes ankylosis of the three
elements of the tribasilar bone.+ The result as to the basis cranii

Using this word as meaning a measurable part.

+ There are other minor deformities. One of these is the "main en trident."
This was first pointed out by Dr. John Thomson, of Edinburgh, in the *Edin-
burgh Medical Journal* for June 1893. Pierre Maine also drew attention to it
in the *Presse Médicale*, 14 Juillet 1900.

is that it is shortened. This shortening is believed by Dr. Jansen and others to be due to anteropressure of the liquor amnii when this is increased in amount, or to amnion tension. He further holds that this heightened amniotic pressure acts between the second and eighth weeks of pregnancy. "The amnion, which is so small that it infolds the fœtus, also increases the hydrostatic pressure, *i.e.*, compresses the fœtus so as to squeeze blood out of it" ([2], p. 361). He does not always state in the text that this pressure is an excessive *local* one, but it is implied and deducible from his diagrams (see [1], Figs. 24-27).

In his paper he emphasises "smallness of the amnion" as the cause, and believes this to be a disease running in families, and showing its effects in a varied manner, causing club-foot and other deformities of the fœtus, anencephaly included.

Dr. Jansen also believes the normal flexed condition of the embryo to be due to amnion tension. There are, further, some facts stated that are not reconcilable. Thus fluid in the temporary periamniotic fluid is said to exert an equable pressure and be unable to exaggerate the normal fœtal bends. Why, however, should periamniotic fluid exert an equable pressure and amniotic fluid an unequal one? Further, if the periamniotic fluid exerts an equable pressure, this would make the amniotic fluid do the same ([1], p. 57). The normal infolding of the fœtus is part of its type of growth, and can be associated with the curved blastoderm of which it is at first a part. The author supposes that if between the 15th and the 21st day a few drops of liquid could be injected into the amnion sac, it would become spherical, and, as the diagram indicates, we would get tension at right angles to the head, breech, and nape of the neck ([1], p. 58, and Fig. 44). Surely the increase of pressure would be equable, and would the increase matter? Multiparous women often have normal children with a relatively great increase of liquor amnii.

We have a condition analogous to achondroplasia in brachydactyly. Here the middle phalanges of the hand and foot are awanting and represented by a small nodule of cartilage ankylosed to the first phalanx. Are we to suppose that this condition is due to an increased local pressure of liquor amnii at the eight local points of the phalanges between the third and eighth weeks?

A similar difficulty comes up as to the shortening of the legs and arms in achondroplasia. How does the increased pressure of the amniotic fluid act on the limbs? Is it all over their periphery or in their long axes only?

The idea of pressure causing normal or abnormal form in the body is dying out. At one time it was held by distinguished observers that the wider brim of the normal female pelvis, as compared with that of the male, was due to the body-weight acting vertically down, and the resistance of the limbs up, when the child began to walk. It has been shown, however (Fehling,[6] Arthur Thomson[7]), that *in utero* the pelvis of the female fœtus differs from the male, and has certain increased diameters. Had the former view held good, the active boy should have had a large brim and the less active girl a small one.

It may now be asked what is the cause of achondroplasia if Dr. Jansen's view is not tenable, or at any rate in what direction are we to look for a solution? I have already written on this subject, and need not therefore go into detail. I may, however, sketch shortly the views I have come to.[8]

Achondroplasia seems to me a condition where there has been a local and discrete disturbance of growth—a local discrete hypoplasia. Symington and Alexis Thomson[9] made the valuable observation that the parts affected were those developing in early endochondral ossification. Their case is a carefully recorded one, and they state that " the essential and characteristic lesion in this specimen is found in connection with the skeleton, and before proceeding to describe in detail the alterations in the individual bones it appears advisable to state first in general terms that the *alterations present are confined to certain groups of bones, while others are quite normal*. The latter are—

" 1. Those which are formed entirely in membrane, *e.g.*, the flat bones of the vault of the skull.

" 2. Those which, although formed in cartilage, remain entirely or mainly cartilaginous till an advanced period of fœtal life, so that their general growth is quite independent of endochondral ossification. As examples of these may be mentioned the sternum, costal cartilages, patella, and the tarsal and carpal bones.

" The departures from the normal affect those parts of the skeleton which, formed in cartilage, largely depend for their growth during fœtal life upon endochondral ossification, the cause of the departure being a premature arrest or absence of this process. The bones belonging to this group are the long bones of the extremities, the ribs, the posterior part of the base of the skull, and the innominate bones" (Symington and H. A. Thomson, *op. cit.*, p. 273).

The curious condition known as craniocleidodysostosis * may be appositely quoted here, as there is probably greatly retarded ossification of the bones developed in membrane. Thus we may regard the bony skeleton as made up of three great sections, viz. the bones developed in early endochondral ossification (limbs, ribs, innominate bones, and basioccipital), the bones developing by late endochondral ossification (vertebral column, sternum, carpal and tarsal bones, inner half of clavicle, scapula), and the bones developing in membrane (vault of skull, hard palate (Jansen), and outer half of clavicle). These are not hard-and-fast divisions, but hold good in the main, and probably the late endochondral system may have to be divided up. Now this suggests at once (to the Mendelian) autonomous unit characters, and by Weismann's generalisation we carry their origin back to the zygote in the form of determinants there, also autonomous; but this is put more suggestively if one says that there are autonomous adult unit characters because the determinants in the zygote are autonomous.

Mendelism has also shown that we have a growth factor for organs, and by pea and other crossings that this factor is autonomous, and therefore, when dwarf and tall plants are crossed,† these two contrasted unit characters are segregated in a probability ratio of $1:2:1$. This probability ratio need not be discussed now, and I go on to suggest that in achondroplasia we have a loss of a growth factor for the bones developing in early endochondral ossification.

This is an exact loss, and I have endeavoured to show that such a loss occurs at fertilisation when the polar bodies, *i.e.* certain determinants, are thrown off, and that it is a mutation, and gives a variation analogous to those of De Vries in the *Oenothera Lamarckiana*.[10]

The details of the proof cannot be given here, but I may refer to the literature at the foot of page 501, which may be consulted by those interested.

The ratio-heredity of achondroplasia is not known as yet, but depends on the origin of the primitive germ and sperm cells from an early division of the variation zygote giving rise to the achondroplasic individual. I consider achondroplasia, therefore, to

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* Here the vault of the cranium and the outer half of the clavicle, that is, the bones developed in membrane, ossify very late, and we thus get a curious membranous vault and a deficiency in the clavicle (see Fitzwilliams, D.C.L., on " Hereditary Craniocleidodysostosis," *Lancet*, 19th November 1910, and also letter, *Lancet*, 1911, vol. i. p. 125.

† See *Phases of Evolution and Heredity.*

be a disturbed local growth arising, as explained above, and leading to a hypoplasia of the bones developing by endochondral ossification, that it is a mutation in De Vries' sense, or a discontinuous variation, to use Bateson's term.

The difficulties I have as to Dr. Murk Jansen's theory of achondroplasia are as follows :—(1) The pressure of the liquor amnii is an equable one, according to the ordinary hydrostatic law. (2) The embryo *in utero* has as its peripheral pressure not only the liquor amnii but the general intra-abdominal pressure, and any small or even large increase in the former can have no significance. (3) A local mechanical pressure between the 3rd and 8th week seems to me irrational. (4) Even if one granted this pressure there is no evidence that it would affect the growth of the bones whose deformities are characteristic of achondroplasia. The fœtus is sometimes exposed for months to the pressure of ovarian or fibroid tumours, but is unaffected.

Dr. Jansen seems to me to have set himself to defend a hydrostatic and pathological paradox when he states in his preface "that abnormally high amnion pressure is able to disturb the nutrition and growth of part of the fœtus without interfering with the normal process of development of other parts of the body."

While urging these objections I willingly accord Dr. Jansen praise for the suggestive way in which he presents his facts.

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THE CAUSATION AND TREATMENT OF DEFORMITIES FOLLOWING ANTERIOR POLIOMYELITIS.

By B. P. CAMPBELL, M.D.(Camb.), F.R.C.S.(Edin.).

II.

SURGICAL MEASURES.

THE last set of therapeutic measures are the surgical procedures adopted to correct existing deformities. I do not propose

in this paper to describe the surgical technique, but only to consider them from a general point of view, and point out to which class of case each operation is especially applicable.

Existing deformities are of two kinds—those which result from unsuitable treatment, and those which follow treatment correctly carried out but unavailing because of the extent of the permanent damage to the nerve cells. It is quite possible for both to be present at the same time if the damage has been extensive and the treatment unsuitable. The essential point of difference between them is, that in those which result from unsuitable treatment the deformity is constantly present, its degree depending on whether the muscles alone are contracted or further structural changes have taken place, while in those which follow correctly carried out treatment no shortening of muscles or ligaments takes place, and it is only apparent when gravity or body pressure act on the weakened part. A very important point of difference is that in the first class the paralysed muscles may regain a considerable amount of power after the deformity is corrected and they are retained in a relaxed position and suitably treated, while in the second no return of power can be expected under such treatment.

The treatment is also carried out on essentially different lines. Its object in the first class is to correct deformity which should never have occurred, while in the second it aims at restoring use to the part, either by evenly distributing the available muscular power, or, if this is impracticable, by permanently fixing the joints. If both varieties are present, the contractions and structural alterations must first be overcome before further measures are undertaken. The surgical measures for the correction of the preventable class of deformities are as follows:—the straightening of the part with the hands or Thomas's wrench, the division of tendons and other contracted structures, the removal of skin areas and the taking in of relaxed tissues, and osteotomy and the removal of portions of bone. I believe these measures will all be unnecessary once the disease receives the treatment it merits, and, as already indicated, they are not curative of themselves, but occupy an intermediate position. After they are carried out the muscles will either regain power under suitable mechanical and medical treatment, or will remain paralysed, when further surgical treatment will be necessary. This comprises three varieties of operations: muscle and tendon transplantation, which aim at evenly distributing the available power; arthrodesis, which permanently

fixes a joint ; and nerve anastomosis, which attempts to open a path for motor impulses from an undamaged part of the spinal cord. When a deformity associated with contraction or structural changes is present, the first thought is always whether it can be overcome without a cutting operation, and this brings us to the consideration of non-operative measures. These are of two kinds— gradual straightening or forcible correction, either with the hands or with Thomas's wrench.

Gradual Straightening.—Gradual straightening aims at reversing the process at work in producing the deformity, and keeps a constant pull in opposition to the contracted muscles, which are steadily stretched, while the paralysed muscles are relaxed and given a chance of contracting. The wrist is the ideal site for carrying out this method of gradual correction, and a contracted wrist-drop responds to it admirably if any vitality remains in the over-stretched extensors (Figs. 2 and 3).*

A malleable iron splint and some strips of adhesive strapping are all that is required, and the joint is first bent in the direction of extension until the flexors are tightly stretched and the extensors somewhat relaxed, when the splint is applied. In a few days it will probably be found that the flexors can again be stretched and the joint further straightened, and by a gradual alteration in the angle of the splint the joint is finally brought into the hyperextended position, when the extensors should answer to the test of recovery. The whole secret of success lies in never permitting any strain to be put on the extensors from first to last, and also in not discarding the splint immediately, but only allowing gradual relaxation of the newly-recovered muscles. Suitable methods of stimulating the recovering muscles must be employed while the gradual straightening is taking place.

Forcible Correction.—Forcible correction lends itself especially to club-foot, in which the process of gradual correction would prove irksome and the patient be kept off his feet for too long, for it is found that if it is immediately reduced and the foot retained in a suitable position the end result is just as good, provided there is still vitality in the paralysed muscles. In discussing this question it is difficult to draw a hard-and-fast line between those methods which necessitate the use of a knife and those which do not, as they are so frequently combined in the same case according to the degree of deformity present, and cases vary from those in which it is possible to straighten the part by exerting considerable force with the hands to those aggravated

* Opposite p. 408.

and old-standing cases in which success is only obtained after division of tendons, ligaments, and fascia, combined with the use of a wrench; between these there are numerous intermediate grades, each requiring to be considered on its own merits.

Wrenching.—The wrench, although an alarming instrument to look at, is very safe in the hands of those who understand its use, and seldom gives rise to any serious damage. The worst misfortunes which can result are the tearing of the tightened skin and the separation of epiphyses, but considerable carelessness must be exhibited before they occur. The sloughing which sometimes follows, and has been attributed to its use, is more probably due to the application of a too tight bandage without making sufficient allowance for the swelling which such severe handling induces. The general rule in a combined operation is to divide the tightened soft parts first and complete the operation with the wrench, but to this there is an important exception. If it is necessary to divide the tendo Achilles, this should always be done last, for so long as it is entire there is a fixed point against which to apply force with the wrench, but after its division there is no means of steadying the foot.

Tenotomy.—The division of tendons is generally an easy matter, and should be carried out subcutaneously, with the following exceptions:—it is best to divide the hamstrings, the biceps in the arm, and the tightened structures on the front and inner side of the hip joint through an open incision to avoid injury to important vessels and nerves. Little harm can result from subcutaneous division of the tightened structures in the region of the foot, but a traumatic aneurysm of the plantar arteries has occasionally appeared. A large and important tendon like the tendo Achilles should be divided slowly and the part gradually stretched to the desired extent, and sufficient time must be allowed for it to unite firmly before use of the part is permitted. The tendo Achilles requires fully six weeks, and this should always be allowed, as a very troublesome form of talipes calcaneus sometimes occurs from further stretching of the tendon. There need be no fear of non-union, as Tubby and Jones[6] only quote four failures in ten thousand tenotomies, the offender in each case being the extensor proprius hallucis.

It is best to divide the plantar fascia through a number of subcutaneous punctures, the tenotome being introduced wherever a tightened band is felt.

After tenotomy and wrenching, the part should be kept quite

still for two or three weeks until all swelling and bruising has passed off, after which gentle stimulation of the paralysed muscles is commenced, and walking with a modified boot and iron is permitted in six weeks from the date of operation.

Shortening of Relaxed Tissues.—Relaxed tendons and ligaments are frequently shortened as an auxiliary measure to a transplantation or arthrodesis operation, and the tendo Achilles has been taken in or pleated in an attempt to correct a calcaneus deformity, but this has not proved very successful. In cases of paralytic dislocation of the shoulder in which the capsule of the joint is stretched and elongated, taking up and shortening of the capsule often brings about considerable improvement. Mr. Jones[7] introduced the operation of removal of oval areas of stretched skin from the convexity of talipes deformities, and of a large diamond-shaped area from the front of the elbow in paralysis of the flexors of the joint. The extent of skin to be removed is determined by pinching it up until the part remains in the desired position, when the pinched up relaxed portion is excised and the two cut edges stitched together. I have had considerable experience of this operation, and have great faith in it if it is put to its correct and original use as an adjunct to retention apparatus and splints, but if it is performed with the object of entirely displacing these, stretching of the cicatrix will certainly cause disappointment. I consider that it is an excellent precautionary measure after wrenching, tenotomy, and transplantation, and of especial service when treating patients who cannot be kept under close observation or are not to be depended on to carry out the prescribed after-treatment, as it continues to retain the part in its correct position and to prevent overstretching of the paralysed muscles if the splint is tampered with or removed for short intervals.

Osteotomy.—Osteotomy is only required in old-standing cases with marked deformity, and these are practically limited to the regions of the knee and foot. Knock-knee calls for simple linear osteotomy of the lower end of the femur, but when there is contracture and flexion or backward deformity at the knee it may be necessary to remove a wedge of bone. In old-standing cases of talipes the astragalus is the bone most frequently attacked, and it is usual to remove from it a wedge with its base towards the convexity of the deformity; in some cases the entire bone is removed. This bone is selected in preference to the tibia, as any damage to the lower tibial epiphysis might cause interference with the growth of the shaft.

Tendon and Muscle Planting.—The objects of muscle and tendon transplantation are to improve the function of the part by an attempt to redistribute the available muscular power and to reduce the deformity. Before undertaking it several details require consideration. Mr. Jones [s] prefers not to operate under the age of five years, as the patient is then too young to give much assistance with the later treatment, and it should be remembered that the treatment only commences with the operation. All secondary contractions must be first straightened, and every available method attempted to restore power to the paralysed muscles. A careful electrical examination should be made to determine the exact condition of all the muscles in the part, and only those which are healthy, active, and sufficiently powerful to do the work should be made use of, as it is unreasonable to expect healthy but weaker muscles to take on the heavier work previously performed by those paralysed. This fact accounts for the failure of the pioneer operation which attempted to make the healthy peronei do the work of the paralysed calf muscles.

Reinforcing muscles are employed either to replace completely those which are paralysed or to assist those which are partially recovered. In some cases of talipes, transplantation is combined with an arthrodesis of the ankle joint. In planning an operation it is important to bear in mind the function of the part. In the foot stability is all-important—flexion and extension of the ankle joint must at least be secured, but movements of the toes are not essential, therefore tendons of muscles with this action can be sacrificed and transplanted into the tarsus; while in the hand the converse is the case—movements of the wrist are not so important, but the finer movements of the fingers must be retained at all costs.

The earlier operations made use of the distal end of the tendon of the paralysed muscle which was attached to some portion of the reinforcing muscle or its tendon, but they failed because it was not realised that a paralysed tendon always stretches further when any strain is put on it. The present method of planting the reinforcing tendon direct into the periosteum or bone is a great improvement, and Lange has extended it by introducing strands of mercurialised silk to lengthen the tendon when it is not long enough to reach the desired insertion. After the muscle has commenced to functionate it is found that these artificial tendons increase in thickness through fibrous tissue being deposited round the silk.

Transplantation operations are most successful when only one

or two muscles are damaged, and are quite useless in cases of extensive paralysis. The replacement of a paralysed quadriceps extensor by bringing forward the hamstrings has proved very satisfactory, and we shall see later that the results are very encouraging in cases of limited paralysis in the foot, arm, and hand.

The most important stage of the treatment begins after the operation, and the part should be first kept immobile for six weeks. After this the education of the newly transplanted muscle is commenced, and is best effected by means of repeated voluntary efforts to perform the desired movement. All possibility of the muscle being overstretched must be guarded against, therefore the removal of a skin flap at the time of the operation is a wise measure, and when the patient commences to walk suitable means must be adopted to prevent the muscle from being overcome by body pressure. The sign of ultimate success is when the transplanted muscle responds forcibly to a voluntary effort and is able to withstand the action of gravity.

Arthrodesis.—The operation of arthrodesis aims at producing permanent fixation of a joint with the least possible loss of bone, therefore the articular cartilage and no more is removed. At least two years should have elapsed since the paralysis started. All secondary deformities must be straightened and every other means to restore power attempted, as it would be folly to fix the joint permanently before giving the paralysed muscles a fair chance of recovery. Mr. Jones[2] speaks very definitely on the question of age, and advises that the operation should never be performed under the age of eight years, and if possible delayed till after ten years of age. He attributes failure to secure bony union and other troubles which arise to too early interference, and remarks that he has never seen bony union result in a patient under four years of age, and that under seven years less than one quarter of the results are satisfactory. Mr. Stiles tells me that he operates with good results on children of five, six, and seven years of age, and attributes his success to maintaining good adaption by driving in a nail to hold the two bones firmly together. In two or three weeks' time it works loose, and is easily withdrawn without any inconvenience to the patient. I have examined patients whom he has treated in this manner, some of them two or more years after the operation, and found that in most cases the union was very secure.

The best results are obtained with an abnormally mobile healthy joint, most of the muscles controlling which are paralysed.

The results at the ankle and mid-tarsal joints are the most satis-factory, and next in order at the knee. These are the only two varieties of which I have any experience, but the operation is occasionally performed at the shoulder and hip joints. In complete paralysis of the foot it is better to fix the mid-tarsal as well as the ankle joint, as this guards against dropping forward of the front part of the foot, but if some of the muscles are acting their tendons can be transplanted into the tarsus to allow movement at the astragalo-scaphoid and calcaneo-cuboid joints, while the fixed ankle joint secures stability.

Arthrodesis of a flail knee should be reserved for poorer patients, to whom it may be more convenient to be independent of apparatus; to the better-class patient a permanently stiff leg soon becomes a great trial, and he will prefer a walking caliper with a joint opposite the knee so that he can sit comfortably.

If it is desired to fix the elbow, a diamond-shaped area of skin should be removed from the front of the arm and the joint itself not interfered with.

After all arthrodesis operations the joint should be kept absolutely immobile until union is firm; this means at least two months for the ankle and three for the knee, after which an appli-ance should be fitted to protect it from undue pressure until the operator is satisfied that no damage can result.

Nerve Anastomosis.—I have no experience of the treatment of anterior poliomyelitis by nerve anastomosis, and shall only give a brief outline of the present views on the subject. The central ends of efferent fibres are able to make functional connection with the peripheral ends of similar fibres, but the difficulty lies in bringing them together, as in a mixed nerve various kinds of fibres are present. The operation is performed either by grafting the peripheral end of the divided paralysed nerve into a slit in the healthy nerve or uniting it to a flap of fibres raised from the healthy nerve; the older method of completely dividing both nerves and uniting the two peripheral ends to the central end of the healthy nerve is unnecessary, and risks loss of conduction in the healthy nerve.

Kilvington[10] in an interesting paper described the results of his experiments on the popliteal nerves. He divided the two nerves, split for a short distance the central end of the internal one into two bundles of unequal size, to the larger of which he united its own peripheral end and to the smaller the peripheral end of the smaller external nerve. After its division each central fibre of

the internal nerve formed two or more branches in an attempt to replace the greater number of fibres in the two peripheral portions to which it was united, and inability to make up this number accounts for some loss of power. If the peripheral end of a divided paralysed nerve is planted into a nerve which supplies muscles of antagonistic action, and if some of the terminal branches of the divided healthy fibres grow down both nerves instead of only growing down one or the other, it is obvious that a considerable amount of power will be wasted through opposed muscles contracting together in response to the same stimulus; this is known as the axon reflex phenomenon. Warrington and Murray [11] described five cases in which no improvement resulted, and they speak discouragingly of the operation. In one case the peripheral divided end of the paralysed nerve was attached to a flap of fibres which were dissected up off the healthy nerve, and in three cases it was planted into a longitudinal slit in the healthy nerve. Stoffel [12] criticised their technique and pointed out that a longitudinal slit may not divide sufficient fibres and thus favour fibrous union; also a sensory portion of the healthy nerve might have been selected. He lays stress on the exact localisation of the different sets of fibres in the nerve trunks, and has found that in the external popliteal nerve the anterior tibial fibres lie near the tendon of the biceps and those of the musculo-cutaneous nerve towards the popliteal space, while the fibres of the musculo-cutaneous and anterior tibial nerves can in turn be differentiated into the cutaneous portion and the branches for the various muscles. Tubby [13] employed sterilised electrodes and found that fibres to the deltoid muscle run in the upper and outer part of the anterior branch of the fifth cervical nerve, while those to the biceps are found on the lower and inner side.

Binnie [14] gives a table compiled by Murphy in which a number of cases of nerve anastomosis are cited; from this it appears that the best results have been obtained in paralysis of the tibialis anticus by planting the nerve to that muscle into the musculo-cutaneous nerve.

Bradford [15] of Boston considers that nerve anastomosis does not yet offer practical relief, and is more or less in its experimental stage.

In view of the recent researches of H. O. Feiss, [16] it is doubtful whether too much importance has not been placed on the accurate apposition of divided nerve fibres. He has proved that if two nerves are tied together so that their sheaths are thoroughly crushed, they

will grow together at that point and the nerve fibres will grow down through the scar; also even if divided nerves are brought into most careful apposition with one another a neuroma always forms between the two cut surfaces and the down-growing fibres must pass through it. His final conclusion is "that there is, as yet, no sufficient experimental basis by which nerve anastomosis for the palsies of infantile paralysis can be justified."

AFTER-TREATMENT.

These are the various methods of preventing and treating paralytic deformities, and few will be found which are not materially benefited by one or more of them. Sometimes, however, cases of extensive paralysis do not respond to mechanical or medical measures, and are unsuitable for surgical treatment, and these are the type in which the more complicated kinds of apparatus can be tried. Two walking calipers will nearly always enable a patient to get about, even if he has two flail legs (Fig. 4).

A few words may be added on the after-treatment, although it has already been considered under the various headings. In this disease I consider the word after-treatment a misnomer, as the serious treatment only commences with the operation, and, except in the case of arthrodesis, where the direct object of the operation is to secure bony fixation of the joint, and therefore absolute immobility is necessary until this results, any operative measure is only carried out to place the part in a more favourable position for the later treatment which becomes the most essential feature, and any slackness in it courts failure. This later treatment after the part is secured in suitable position must be continued until either the test of recovery is present or no further improvement is to be expected, and consists in suitable stimulation of the recovering muscles, exercises, and perfect protection from the action of gravity or body pressure by means of suitable splints, modified boots, irons, or other appliance, which must only be discarded gradually, as the muscles become stronger. It is impossible to lay down any fixed length of time, but probably in no disease is conscientious perseverance so frequently rewarded with success.

CONSIDERATION OF THE INDIVIDUAL DEFORMITIES.

Before concluding I shall enumerate the commoner varieties of deformity, and point out briefly in each case the most suitable lines of treatment. It must, however, be understood that almost any muscle in the body can on rare occasions be affected, although

I do not propose at present to consider these rarer varieties, but only those which are likely to be met with any day in practice.

In most cases the extensor muscles of the limbs suffer more severely than the flexors, and the legs more than the arms. In an analysis of seventy-six cases Byrom Bramwell[17] found that residual paralysis was present in one or both legs on fifty-one occasions, while one or other arm alone was affected on fourteen. On four occasions there was some paralysis present in each of the four limbs. The legs probably suffer more severely because the lumbar enlargement of the cord receives its blood-supply from the most peripheral branches of the anterior spinal artery.

The muscles in the arm most frequently affected are the deltoid, spinati, biceps, and supinators, while in the leg the peronei, extensors of the foot, tibials, and quadriceps extensor suffer most; the sartorius and ilio-psoas usually escape.

Spine.—The commonest deformity of the trunk is a very persistent form of scoliosis which results from partial paralysis of the erector spinae muscle on one side. In cases in which the limbs are affected a careful watch should be kept on the spine when the patient begins to get up, as it is then that the deformity usually makes its appearance, and, once established, it is very difficult to treat; exercises for the spine cause but little improvement, and a spinal support is nearly always necessary.

Serratus Magnus.—The serratus magnus is occasionally paralysed, and well-marked deformity appears when the patient attempts to raise the arm in front of him or to make a thrusting movement; the vertebral border and lower angle of the scapula stand away from the body, and the fingers can be slipped beneath it. The application of a padded belt to keep the scapula against the body is generally inconvenient, but Tubby[18] has had a successful result by transplanting the sternal part of the pectoralis major into the serratus magnus, as near to the vertebral border of the scapula as he could reach.

Upper Extremity.—The distribution of the paralysis in the upper extremity is very varied, and often more than one deformity is present. In relation to the three chief joints of the limb the muscles most frequently affected are the abductors and external rotators of the shoulder, the flexors of the elbow, and the extensors of the wrist and fingers. The plan of treatment is always first to give mechanical and medical measures a thorough and extended trial, which means that the paralysed muscles should be relaxed and suitably stimulated, and only when this has failed should

operative measures be resorted to. If suitable treatment is adopted considerable improvement can be expected, except in the rare cases in which the arm is completely paralysed and hangs quite loose, when no treatment does any good.

The deltoid, alone or together with the supraspinatus and infraspinatus muscles, is not infrequently paralysed, and gives rise to a typical angular appearance of the shoulder and loss of power at the joint (Fig. 5). The arm hangs loose because the paralysed muscle and capsule stretch, and the head of the humerus is no longer held up against the glenoid fossa, and in old-standing cases dislocation of the joint easily takes place. This deformity is frequently combined with paralysis of the flexors of the elbow, that is, of the biceps, brachialis anticus, and supinator longus muscles, and the whole arm, with the exception of the hand, is powerless. If it remains untreated the hand is useless, as it is placed at the distal end of the paralysed limb. Wrist drop, either occurring alone or in combination with the above deformities, is common, and results from paralysis of the extensor muscles of the wrist and fingers (Fig. 2). All these upper extremity deformities are primarily due to the force of gravity acting on the arm or hand, and the contracted drop-wrist often met with later is only a secondary feature.

Shoulder.—The deltoid muscle is very resistant to simple treatment, possibly because it is difficult to keep it constantly in a relaxed condition. This is best accomplished by somewhat abducting the arm from the side by means of a bent malleable iron splint, one limb of which is fastened to the side of the chest and the other to the upper arm, the apex being in the axilla. Should the muscle fail to regain power when so retained and suitably stimulated, the question of muscle or nerve transplantation can be considered. It will be remembered that I described how the fibres to the deltoid could be differentiated in the upper and outer part of the anterior branch of the fifth cervical nerve, and they can be divided—separated down for about an inch, and the flap of nerve fibres grafted into the sixth cervical nerve. If the flexors of the elbow are also paralysed the whole nerve is divided and grafted into the sixth. If muscle transplantation is preferred an attempt is made to replace the deltoid by detaching the clavicular insertion of the trapezius and dividing the clavicular part of the pectoralis major close to the humerus. These two are united and fixed into the outer side of the humerus as low down as possible, the arm being held in the abducted position the whole time.

Before permanently fixing the shoulder it is important first to determine accurately the condition of all the muscles in that region, as should those connecting the humerus with the scapula alone be at fault an arthrodesis will prove beneficial, but if those holding the scapula to the trunk are also involved it will be useless. The best position in which to fix the joint is with the arm somewhat abducted and rotated inwards.

Upper Arm and Elbow.—To relax the flexors of the elbow the arm should be retained in a sling halter passing from the wrist to the neck in such a position that the flexion angle at the joint is rather less than a right angle (Fig. 6). If no power returns, a nerve or muscle operation can be tried. Tubby[19] has introduced a very effective operation, which consists in detaching from the humerus the insertion of the outer head of the triceps, bringing it round the outer side of the bone and planting it into the biceps, the elbow being in the fully flexed position. Should these measures fail to restore power while the hand is still useful the elbow can be retained flexed by the removal of a large diamond-shaped area of skin from the front of the joint. This enables the patient to make use of his hand for feeding and other purposes.

Forearm and Hand.—Contracted wrist drop is eminently suitable for mechanical treatment by retention on a malleable iron splint, the angle of which is gradually altered until hyperextension of the joint is finally reached (Fig. 4). If this fails to restore power the flexor carpi ulnaris and flexor carpi radialis can be transplanted to the dorsum of the carpus, and any shortened flexor tendons lengthened.

Lower Extremity.—In the lower extremity the methods and objects of treatment are the same, except that stability must be gained at all costs, even at the expense of movement, in order that the limb may be strong enough to bear and transmit the body weight, while in the arm the finer muscular movements are of first importance. The arm is only acted on by gravity, not by body pressure, and the shoulder is most frequently affected, but in the leg the commonest sites of deformity are the foot and ankle. For these reasons mechanical supports are more frequently employed for the lower extremity, and the operation of arthrodesis is often performed. The muscles of the leg that suffer most are the extensors and abductors of the hip, the extensors of the knee, and the evertors and extensors of the foot. The ilio-psoas and sartorius, both of which flex the hip, usually escape even in severe cases.

Hip.—Paralysis of the hip may be partial, causing considerable instability of the limb, or most of the muscles controlling the joint may be affected, and the patient unable to bear his weight on the leg, and dislocation is liable to occur as a later result. The flexor tendons are usually contracted, but in mild cases the limb will straighten if the patient is kept on his back. Should it not do so, the tightened structures on the front of the joint must be divided through an open incision. In severe cases there are often deformities at the knee and ankle which must be treated before a splint is applied. The most satisfactory treatment is to fit a Thomas's walking caliper once the flexion contraction is straightened, as it takes the body weight off the weakened joint. A patient can walk fairly well with two calipers if the ilio-psoas is acting, as it is a strong flexor of the hip, and assists in bringing the limb forward (Fig. 4).

Thigh and Knee.—The results of paralysis at the knee are simple inability to extend the joint voluntarily, complete loss of power and insecurity, or the flexor muscles may be contracted and shortened, with possible distortion of the bones. When the hamstrings are paralysed the extensors are always involved also, and a flail knee results. The comparative immunity of the hamstrings is of great importance, as it provides strong muscles for transplantation.

Before carrying out treatment on the knee the foot must be straight and strong enough to bear the body weight. The commonest variety is weakness of the quadriceps extensor muscle, which prevents the patient from keeping the knee firmly extended when he stands, and therefore causes instability (Fig. 7). The proper treatment is first to take all strain off the weakened muscles. This is best accomplished by means of a walking caliper which keeps the joint extended while enabling the patient to get about. If sufficient power does not return muscle transplantation can be practised, and the results are very satisfactory. If the sartorius is acting it can be divided opposite the patella and planted into that bone, or the biceps and semitendinosus can be brought forwards and attached to the tubercle of the tibia by artificial silk tendons. The muscles are carefully massaged and stimulated, and the use of the caliper continued until the newly transplanted muscles are sufficiently strong.

If there is any contraction of the hamstrings it must be first overcome either by extension on a Thomas's knee splint, forcible stretching, or in old-standing cases by division of the tendons

through an open incision which should be longitudinally placed so that it will not gape when the limb is straightened. Sometimes it is also necessary to remove a wedge from the lower end of the femur.

The two commonest deviations of the limb are genu valgum and genu recurvatum (Figs. 8 and 9). Early cases of genu valgum can be straightened by extension on a Thomas's knee splint and drawing the knee towards the outer side bar, but severer cases require osteotomy of the lower end of the femur. In genu recurvatum the joint is abnormally extended, and the tibia is sometimes displaced backwards. It occurs in extensor paralysis, and usually results from the patient throwing his weight so as to extend the joint fully, because slight flexion causes it to give way under him. The best treatment is to transplant a muscle which will take the place of the paralysed extensors, and to fit a walking caliper until the power of extension returns.

When all the muscles controlling the knee are paralysed, or muscle transplantation fails, two courses of treatment are possible— either a walking caliper with a hinge joint opposite the knee, to allow flexion when the patient sits, can be supplied, or the joint can be permanently fixed by performing arthrodesis. I have already mentioned that arthrodesis of the knee should not be too freely performed, as the permanently stiff joint is generally a nuisance, but it is often an advantage for working men who prefer to be independent of apparatus.

Leg and Foot.—The talipes or club-foot group of deformities form the last and also the largest group that remains to be considered. They occur in relation to the four chief movements of the foot, namely, extension, flexion, eversion, and inversion. Paralysis of the extensors predisposes to equinus deformity, of the flexors to calcaneus, of the evertors to varus, and of the invertors to valgus. These are the simple forms, but they are also combined in varying degrees. I mentioned that the evertors and extensors of the foot were most frequently affected, therefore the commonest varieties are varus and equinus, and the combination equino-varus. Although not so common, calcaneus, valgus, and calcaneo-valgus are by no means rare. If all the muscles controlling the ankle are paralysed the foot is loose and flail-like, and assumes various positions, according as gravity and body weight act on it at different times. These deformities are often complicated by a cavus condition, which results from the dropping forward of the front part of the foot, followed by contraction of the plantar fascia.

If no deformity has developed preventive measures should be adopted, and the foot retained on a rectangular club-foot shoe; when deformity is present the general aim of treatment is first to overcome it, then to retain the foot in a slightly over-corrected position, and to massage and stimulate the weakened muscles. The best retention apparatus is a malleable iron splint bent to the desired angle, or a club-foot shoe. Once the muscles begin to recover power walking with a modified boot and iron is permitted, but if sufficient power does not return after a prolonged spell of treatment, muscle transplantation can be tried, and if the foot ultimately remains weak and insecure permanent fixation by arthrodesis is necessary. In well-marked cases in which two or three varieties are present together, for example cavus, varus, and equinus, the best general rule is to overcome them one at a time, commencing at the front of the foot and finishing at the ankle. When it is necessary to divide the tendo Achilles it should always be the last step, except when a skin area is finally removed as a precautionary measure.

Talipes Equinus.—Talipes equinus is a gravity deformity, the primary cause being the dropping forward of the foot because the extensor muscles are not strong enough to hold it up; it can also be much aggravated by the pressure of bed clothes on the foot. In the lesser degrees no visible deformity is present, but it nevertheless exists if the ankle cannot be fully dorsiflexed, and constitutes what is known as right angle contraction of the tendo Achilles. The chief symptoms are pain in the calf and instability on walking, as the patient is unable to take steps of ordinary length without bending his knees to relax the tendo Achilles and restore full dorsiflexion. Starting from this variety there are all grades of intensity, up to those in which the heel is drawn up off the ground and the patient hobbles on the heads of the metatarsal bones or even on the dorsal aspect of the toes (Figs. 10 and 11). The severer forms are nearly always complicated by shortening of the plantar fascia and a cavus deformity.

The treatment varies with the degree: the milder forms often yield to gradual passive dorsiflexion of the foot with the knee fully extended, combined with the use of a boot the heel of which is removed, and a club-foot shoe at night. If this does not suffice, the tendo Achilles can be stretched with the wrench or lengthened by division; after division of the tendo Achilles the foot must always be kept immobile on a splint or in plaster for six weeks, or excessive stretching is liable to occur and the opposite deformity result. Walking is

first undertaken with a boot the heel of which is lowered and the sole slightly raised, and a posterior iron is added to prevent movement at the ankle. After some time the iron can be discarded and the modified boot continued, and a rectangular splint is worn at night for some months after the condition is apparently cured.

If the plantar fascia is shortened it must be divided with a tenotome and the foot straightened out before the tendo Achilles is lengthened. In old-standing cases it may be necessary to remove a wedge from the astragalus. If the paralysed extensors do not regain much power, slips from the tendons of tibialis anticus and peroneus brevis can be planted into the dorsum of the tarsus.

Talipes Varus.—Talipes varus results from paralysis of the peronei muscles, and is often met with in combination with equinus (Fig. 12). Various degrees exist, a slight one being that in which the affected muscles have almost regained power and the outer side of the foot only drops a little when the patient raises it between each step, and he tends to come down on the outer side of the dorsum. This can generally be remedied by putting an additional wedge of leather along the outer side of the sole and heel of the boot to relax the weak muscles, and retaining the foot at night in a slightly everted position. If the tibial tendons and internal lateral ligament are shortened and do not yield to stretching, they must be divided and the foot twisted into the everted position, and in old-standing cases a wedge with its base to the outer side must be removed from the astragalus. If the muscles do not regain power the tibialis anticus can be transplanted to the outer side of the tarsus, and a skin area is generally removed from the outer side at the same time. When walking is resumed the modified everted boot with an internal iron is made use of.

Talipes Valgus.—Talipes valgus is the exact converse, and the patient walks on the inner side of the foot; it results from weakness of the tibial muscles. In mild cases the addition of a wedge of leather to the inner side of the sole and heel of the boot with the use of a splint at night will suffice, but severer forms require treatment on the same lines as for varus, except that when an iron is used it is worn on the outer side of the ankle and leg. When muscle transplantation is carried out, the peroneus brevis, peroneus tertius, or extensor proprius hallucis is fixed to the inner side of the tarsus and the foot inverted.

Talipes Calcaneus.—Talipes calcaneus follows partial or complete paralysis of the calf muscles, and once established is very difficult to treat by simple measures; the variety which sometimes follows division of the tendo Achilles must be borne in mind. The heel is gradually lengthened until the os calcis assumes an almost vertical position and the lower ends of the leg bones form a rounded prominence above it. The toes are first raised above the ground, but later gravitate down, and a marked cavus deformity is added. Early cases can be treated by heightening the heel of the boot, and a side iron with a check to prevent dorsiflexion of the foot can be fitted. Severer cases do not yield satisfactorily to the usual measures. Tendon transplantation is not very successful, and this is not surprising when it is realised that the calf muscles are a stronger combination than all the other muscles governing the foot put together, therefore it is unreasonable to expect one or two of these muscles to do their work. Shortening of the tendo Achilles is also unsatisfactory, as the paralysed tendon usually stretches again, and there are in addition alterations in the ligaments and tarsal bones.

The operation which I have seen practised with excellent results is that devised by Mr. Jones.[20] The first stage consists in straightening the front part of the foot. A wedge with its base upwards is taken from the front of the astragalus, and the foot is bandaged to the front of the tibia, greatly increasing the deformity. Three or four weeks later an arthrodesis of the ankle is performed through a posterior incision, and sufficient bone removed from the astragalus to allow the foot to be brought down to the right angle; it is then retained on a club-foot shoe or in plaster for six weeks, after which the patient walks with a posterior iron, to prevent movement until union is quite secure. If, however, there is some power in the calf muscles the second stage is modified and not carried out as an arthrodesis; instead the posterior ligaments of the ankle and the tendo Achilles are shortened, a posterior skin area is removed, and the foot is retained at right angles for three or four weeks, after which walking with a side iron with a stop to prevent dorsiflexion is permitted.

Mixed Forms of Talipes.—Of the mixed forms of talipes, valgus or varus can be combined with either equinus or calcaneus, and cavus can be present in any variety; the commonest combinations are equino-varus and calcaneo-valgus. The methods of treatment are the same as for the simple varieties, only when two are present they must be dealt with one at a time. It is best first to correct

the valgus, varus, or cavus, and finish with the equinus or calcaneus, and a knowledge of the methods of treating the simple deformities will suggest the most suitable treatment for any individual case.

Flail Foot.—In cases of extensive paralysis in which mechanical treatment has failed and tendon transplantation would be unsuitable there need be no hesitation about permanently fixing the joint by arthrodesis. It is a perfectly justifiable and satisfactory procedure, and enables a useless foot to bear the body weight. In bad cases it is better also to fix the mid-tarsal joint, to prevent the front part of the foot from falling forwards, but when a little power remains the ankle can be secured and tendons planted into the tarsus to restore some movement at the tarsal joints.

Conclusion.—I must acknowledge my thanks to Mr. Robert Jones of Liverpool, who aroused in me an interest in this subject during the period I worked under him, and his teaching will be recognised all through this paper. I must also thank those members of the staffs of the Royal Infirmary and Royal Hospital for Sick Children, Edinburgh, who permitted me to make use of the material at their disposal, and to obtain any necessary photographs.

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NOTE ON A CASE OF AMYOTONIA CONGENITA (MYOTONIA-CONGENITA OF OPPENHEIM).

By DENIS COTTERILL, M.B., F.R.C.S.,
Clinical Tutor, Royal Infirmary.

AMYOTONIA CONGENITA or Oppenheim's disease is of such rarity that I may, before passing to the actual case, give a short description of the condition ; in this description I shall quote freely from the text of an article on the subject by Haberman.[1]

In 1900 Oppenheim[2] described a condition occurring within the first two years of childhood in which there is a general or

localised atony of the muscles associated with partial or complete loss of the tendon reflexes. The limbs, particularly the lower, are frequently flail-like, and there is always impairment of active movement. Slight cases show hypotony and marked weakness, but in severe cases the limbs lie perfectly still, as if completely paralysed; in these latter cases one can note occasional contractions of various muscles, which are not, however, sufficient to move the limb. The muscles feel flaccid, soft, and thin, but not definitely atrophic. While there is considerable quantitative alteration in the electrical responses, even up to complete disappearance of reaction in the severe cases, there are never any qualitative changes, and in mild cases the reactions are normal. No abnormalities, as far as can be judged in such young children, are found in the intelligence, sensory system, or special senses. The malady appears to be always congenital. Oppenheim himself thought that the fault lay, not in the central nervous but in the muscular system, which was probably retarded in its development; in support of this theory he mentioned that he had occasionally observed partial or complete return to the normal in the course of time, and that, further, he had never noticed the condition in older children.

Since the first description of this disease there have been a fair number of cases reported,[3] and Haberman, in 1910, had collected 35 or 36 and also the notes on four autopsies. From the accounts of these cases this author draws the following conclusions:—"Neither sex predominates. There is no heredity. Pregnancy and parturition is normal. In most cases nutrition is good. In many adiposis was noticed, and these children were pale and flabby, but the growth was normal and in no case was rickets observed. The muscles were soft and doughy but never reported as definitely atrophic. No trophic changes were noted except in five cases; in one of these the lower limbs felt cold and the skin looked mottled, in the other four cases there was a myxomatous condition of the skin described. The cranial nerves were always normal, as were also the sphincters, the sensory system, and the intelligence. In all cases the patellar reflexes were absent, and in some the skin reflexes also. Electrical responses were much diminished or entirely absent but never qualitatively altered. In all cases the chief symptom was the immobility of the limbs and the inactivity of the child. Most probably all cases dated from birth, and the condition was noticed within the first few days. In most cases movements or 'remnants'

of movements were present in the atonic muscles, if not active, then at least on pain stimulation. In a few absolute immobility seemed to obtain. Many cases showed improvement after long-continued treatment, but in others no improvement occurred. In all instances the lower limbs were affected, in more than half the upper limbs also (though usually to a lesser degree), in many the trunk, in five the head, in two the diaphragm, in three strabismus was present, and in one the facial muscles appeared weak. The throat and cranial nerves therefore appear on the whole to be free. When movements were executed co-ordination was never disturbed. Nearly all showed a functional kyphosis, usually very intense on sitting. In two cases atrophy of the bones of the lower limbs was noticed. The distal parts of the limbs were always less affected than the proximal. Slight cases showed hypotonicity only, and severe cases absolute atony."

" The cases reported in England are mostly of older children— 5 to 10 years of age—and in most of these contractures were noted, doubtless due to the long continuance of the disease. The muscles were said to be small and thin, and the description suggests considerable wasting even though no real atrophy should have occurred. Adiposis was not noticed in these cases. The British writers[4] emphasise the long narrow pad-like formation of the feet and hands. The joints are especially hyperextensive. Some of these cases show discrepancies which make the diagnosis somewhat doubtful."

Where a microscopic examination has been made, the changes in the muscles show loss of transverse striation, irregularity in the size of the fibres, and the presence of much fatty and connective tissue rich in nuclei; in fact the muscles present much the appearances seen in the dystrophies and spinal atrophies.

The changes in the nervous system are most noticeable in the anterior horns of the cord, where the cells are abnormally few and small. The anterior nerve roots have also been noticed to be diminished in size, and in one case there was found to be lack of myelination of the axone cylinders in the sciatic nerve. In one typical case of amyotonia there were no changes whatever to be found in the cord or nervous system.[5]

" From these pathological findings no definite conclusions can be arrived at, but they lead one to believe that the muscle changes are secondary, not to a degeneration of the ganglion cells of the anterior horns, but rather to a retarded development of these cells or to a congenitally enfeebled or enervated condition."

Various points in the differential diagnosis may be mentioned here. In congenital myxœdema, mongolianism, and markedly in rickets we find a considerable degree of muscular atony. The first two conditions, however, usually present very definite features of their own, and from recent work on the subject it is thought to be most improbable that the third condition (rickets) can be so developed at birth as to produce symptoms which might cause it to be confused with amyotonia congenita. Poliomyelitis gives rise to marked atrophy, trophic disturbances, and the reaction of degeneration. The distribution of the paralysis is, unlike amyotonia, rarely symmetrical, and the partial recovery at least is fairly rapid. "Infantile spinal progressive muscle atrophy" is an essentially familial and hereditary disease. It is also progressive, and is, in contradistinction to typical amyotonia, post-natal in onset. Certain of the muscular dystrophies closely resemble amyotonia both in their effects on the motive powers of the patient and also in their electrical responses. These dystrophies are, however, usually familial and progressive, and they differ from amyotonia in that in the latter disease whole groups of muscles are influenced, whereas in the dystrophies we commonly find isolated muscles, or even parts only of muscles, affected. The pathological findings in amyotonia and the dystrophies are very similar, and Gordon[6] seems to hold the view that the two conditions are, pathologically at least, very closely related.

Having thus outlined the condition, I may pass on to the description of a case, and though it will be seen that it presents certain atypical features, its many points of similarity probably justify the diagnosis of amyotonia congenita.

N. W., girl, aged $2\frac{1}{2}$ years. The patient was brought down from Orkney by her mother to the Royal Infirmary on account of a club-foot, and it is through the kindness of Mr. Hodsdon, to whose ward the child was admitted, that I have been enabled to investigate and publish the record of this case. The child, who is the youngest of a perfectly healthy family of three or four, was born at full time. Parturition was short and easy, and there was no instrumentation or history of trauma. From the very first the mother noticed that the whole of the child's body was abnormally flaccid, making it quite difficult to lift in the ordinary way, for "it seemed to just double up and slip through the hands." The child did not kick about or use the limbs normally. The mother tried to nurse the child on the breast, but found that it could not suck. Bottles were then given, and a variety of different teats tried without any success, and eventually the milk had to be slowly dropped into the open mouth. The mother

states that the child seemed to be able to swallow perfectly well, and seemed to want quite an unusual amount of food. A few days after birth the child was noticed to be making a curious, somewhat crowing, noise when it breathed, which the parents were informed was due to "a narrowing of the wind-pipe." This peculiar noise, the onset of which seems to have been fairly sudden, persisted for some months, and then it gradually diminished, and now the breathing is quite quiet and normal. It must be understood that though the noisy breathing was not noticed till the child was a few days old, the general flaccidity was observed immediately after birth, and was therefore obviously congenital.

The child, though pale and rather flabby looking, is moderately well nourished, and though the trunk and face are but thinly covered, the limbs are well endowed with subcutaneous fat. This is clearly shown in the radiogram of the lower limbs (Fig. 6). The child presents a somewhat vacant and stupid facies, for it keeps the mouth constantly open, and the upper eye-lids droop quite definitely. The face is noticeably immobile, and the expression alters but little even when the child cries or tries to smile. When nothing is going on in the ward the patient lies out quite flat and motionless, but when there is any movement near her she sits up in a peculiar hunched position, always exactly the same, leaning over to the right side, with the arms and head hung forward, and the hands resting on the thighs. Though the nurses tell me that the child is fairly intelligent, and can talk moderately well, I am of the opinion that she is definitely backward. She has a most "peevish" disposition, and cries whenever one goes near to examine her, which makes it hard to judge of her mental capabilities. I have noticed that the child is listless and inactive, and never amuses herself with toys as any normal child of her age would do. The child is, if anything, large for her age, and there are no evidences of rickets or myxœdema. No abnormality of the thyroid can be detected. The skin, though pale, is not mottled or cold.

The head is normally shaped. There is no craniotabes, and the anterior fontanelle is closed. Hearing and sight, as far as one can judge, are normal. There is no squint or apparent weakness of the muscles moving the eyes.

The child voids both faeces and urine in the bed without making any attempt to draw the attention of the nurses. In a typical amyotonia the sphincters are not affected, and in this case I am pretty well convinced it is not a true incontinence, as the urine does not dribble away but is voided only at intervals, and the habit is most probably due to the mental backwardness and lack of training. The child is extremely constipated, as may be judged from the radiogram of the trunk (Fig. 5), and this seems to be a very constant feature in these cases.

Muscular System.—It is evident from what has been said earlier that there is definite lack of tone in the facial muscles, for though they all seem to have the power of contracting to some extent when specially stimulated, the face is abnormally immobile and expressionless. This point is illustrated in Figs. 1 and 2, for the child was crying violently all the time the photographs were being taken. The eyes can be firmly closed, but I have not noticed the upper lids ever fully raised. The mouth, though usually kept open, can be quite firmly shut, and the lower lip does not sag away from the teeth. The child can breathe quite freely through the nose. The only muscles of the neck that can be definitely identified by palpation are the sternomastoids, and they almost seem as if they were somewhat contracted, for they stand out firmly and visibly, and one notices comparatively little rotatory movement of the head on the trunk. In the shoulder girdle all the muscles are small and weak. The muscles inserted into the posterior border of the scapula are particularly thin, and cannot be palpated. When lifted under the armpits the shoulders rise up abnormally. The pectoral muscles are present, but hypotonic, on both sides. The upper arms cannot be raised to the horizontal ; in fact the child can do little more than raise the hands to the level of the mouth. The biceps appears to be, if anything, slightly stronger in action than the triceps. Both forearms are weak, as are both hands. The extensors of the fingers seem stronger than the flexors, and in order to grasp any object the child has to dorsiflex the wrist. Where the object is small it is held by complete flexion of the fingers at their proximal interphalangeal joints with the metacarpo-phalangeal joints fully extended, and the thumb is not used. If the object is large the fingers are kept fully extended at their interphalangeal joints, and flexion occurs at the metacarpo-phalangeal joints. Both this and the former procedure in holding objects are doubtless performed in order to take up as much slack as possible on the hypotonic, and probably stretched, flexor muscles. When the extensors of the fingers are thrown into strong contraction the fingers are hyperextended to about 30° at their proximal interphalangeal joints.

The muscles of the trunk are all markedly hypotonic. In the back there is obvious weakness, and this gives rise to a fairly pronounced functional kyphosis when the child sits up. The diaphragm apparently acts normally. There is divergence of the lower part of the thorax, and there is but little movement of it as a whole. The abdomen is large and pendulous and the muscles markedly weak. There is an umbilical hernia, through the neck of which the tip of the little finger can be inserted ; above this there is a distinct narrow wedge-shaped bulging—not amounting to a hernia—which shows only when the child strains. The apex of this bulge is about 1½ inches above the umbilicus, and the base, which is approximately an inch wide, is

formed by the lower margin of the thorax. I believe that this condition is due to weakness and slackness of the fascial structures in the mid-line of the body between the recti muscles, which normally diverge somewhat as they pass up to the ribs.

In the legs there is very distinct flaccidity of most of the muscles. The child can flex the hips against gravity, and the extensors of the knees are apparently rather stronger than the flexors. I judge of this because when the child struggles the legs are extended at the knee, and not, as in a normal child, flexed. The feet can both be moved to some slight extent. On the right side, where there is a club-foot, the toes can be dorsiflexed a little, and the muscles inserted into the tendo Achilles and the tibialis anticus, all of which muscles are shortened considerably, can be quite strongly contracted. In the left foot there is some power of flexion of the toes, but only very slight power of voluntary movement at the ankle in any direction.

Contractures.—As mentioned earlier, I am inclined to think that there is some degree of shortening of the sternomastoids; but, on the other hand, it is quite possible that their rigidity may have been merely due to a normal contraction in the effort to keep the somewhat unstable head fixed. In the left hand there is a slight contracture, involving, as far as I could discover, the skin only, and which may be secondary to the position of the thumb, of which mention will be made later. In the right knee there is shortening of the extensor muscles, which does not permit of more than about 65 to 70 of flexion. In the right foot there is considerable contraction of the tibialis anticus, and of the muscles inserted into the tendo Achilles. These contractures in the hand, knee, and foot are all associated with deformities which will be discussed at a later stage.

Before passing from the muscular system there are two points I should like to mention. One writer[7] has drawn attention to the fact that in amyotonia it was usually very difficult to differentiate by touch between skin, fatty tissue, and muscles. This feature was most marked in the present case. In the legs and arms it was quite impossible to say what one was gripping, as the different soft parts, including the skin, were absolutely homogeneous to the touch. The only muscles in the body one could definitely recognise in their continuity were the sternomastoids. The second point is one I have not seen touched on elsewhere. It struck me in observing this case, that though there was most marked hypotonicity in practically all the muscles when the child's attention was taken up by something else, when there was an intense mental effort on its part—as when it tried to resist being lifted—there was very considerable power in many muscles. The muscles which perhaps exhibited this power most markedly were the contracted muscles of the right leg and foot, the flexors of both hips, and the biceps and extensors of the fingers in both upper limbs. In other

words, it would appear as if a certain number of the muscles of the body had the capability of acting strongly, but required a specially powerful stimulus to make them do so.

Deformities.—Under this heading I shall also include abnormal mobility. The scapulæ, which lay unusually high (Figs. 2 and 4) and rotated forward on the thorax, were very mobile, and one could get one's fingers under their posterior borders, just as in a case of " winged scapula." When these same bones are moved against the thorax there is a sensation of coarse, hard crepitation, as if two rough bony surfaces were in contact. None of those to whom I showed the case had felt anything like it before, and we were quite unable to account for it, as there was no demonstrable malformation or exostosis. The left elbow could be considerably hyperextended, and both wrists could be dorsi-flexed so that the fingers touched the forearm. I have already mentioned the hyperextension of the fingers. The hips are both abnormally mobile : there is a slight degree of genu recurvatum on the left, and the same condition, only more marked, on the right. The left ankle permits of abnormal movements in every direction, but most noticeably laterally. If an attempt is made to make the child stand the legs just collapse under her, and assume extraordinary positions. There is a fairly marked degree of kyphoscoliosis. The whole spine takes part in the kyphosis, which is merely functional (Fig. 2), and the scoliosis is right dorsal, left lumbar ; there is considerable bulging of the ribs on the right side posteriorly (Fig. 1). When the child is lifted by the shoulders the lateral curvature improves, but does not entirely disappear, thus indicating some structural changes. We have here a fairly marked structural scoliosis of the compound type, and I think that, in the absence of any signs of rickets, it is most improbable that simple muscular weakness would give rise to a curve of this type. When the age of the child is considered, and it is remembered that the patient has spent by far the greater part of its life flat on its back, one can only conclude that the scoliosis is in all probability congenital. A radiogram (Figs. 4 and 5) shows, it is true, no definite abnormalities in the structure of the spine or the ribs, but this by no means precludes the diagnosis of its being congenital, for some of these congenital scoliotic spines display no abnormalities when a radiogram is taken. It should be noted that in the two radiograms of the spine the child was anæsthetised, and was lying flat on its back, as straight as possible. Further, it is of interest that, in spite of the considerable deformity from the scoliosis, there was quite unusual mobility of all parts of the spine.

It was obvious that there was some deficiency or abnormality of the lower part of the sternum, though we were unable to verify this either by palpation or by means of radiograms. To the touch it feels as if the ribs practically met at the bottom of a sort of sulcus by means of

their cartilages, and, though one cannot distinguish a definite gap, when the child inspires strongly, as in crying, there is an indrawing to a depth of nearly $\frac{3}{4}$ of an inch of that part of the chest wall which corresponds to the lower half of the sternum. It is possible that the condition may have been one of pectus excavatum associated with very lax costo-sternal ligaments allowing of abnormal mobility of the sternum.

The thumb of the left hand is usually held absolutely transversely across the palm, and this has resulted in a partial dislocation at the metacarpo-phalangeal joint. When the thumb is passively extended a certain amount of resistance has to be overcome, and the dislocation reduces itself with a distinct snap. As may be seen in Fig. 1, the child can partly extend the thumb voluntarily. The extension of the thumb is also hindered by the presence of the tight fold of skin passing from the base of the proximal phalanx on towards the middle of the palm.

The child has got a dislocation of the right hip. The leg is kept fully externally rotated, so that the knee looks directly outwards. Measured from the anterior superior spine to the internal malleolus there is a difference of nearly $1\frac{1}{2}$ inches in the two limbs, but the dislocated leg can readily be pulled down to its proper length. Movements of the thigh on the pelvis are abnormally free in all directions. One cannot feel any cavity corresponding to the acetabulum. A radiogram of both hips and pelvis (Fig. 5) shows, on the right side, an irregular and somewhat shallow acetabulum, and a very faulty development of the head and neck of the femur. The right half of the pelvis appears rather smaller than the left, but this may be merely due to the parts not being " square on " between the tube and plate. On the left side there is possibly a slight degree of coxa valga. In the radiogram of the hips and pelvis reproduced here the head of the right femur is seen looking directly forwards, owing to the leg being fully externally rotated. The inset drawing was taken from another radiogram which showed the head of the femur clearly, but it was too thin to reproduce. The condition of the acetabulum and head of femur is exactly the same as often seen in congenital dislocation of the hip. In fact the dislocation in this case is only unlike the ordinary congenital type in its unusual mobility, which is of course accounted for by the amyotonia, and there is, I think, no doubt whatever that it is truly congenital.

On the right there is a genu recurvatum, associated, as it occasionally is in marked cases, with a partial dislocation backwards of the femur (Fig. 6) and a very small patella. The patient cannot flex the leg from the hyperextended position, even when assisted by gravity. When one attempts to flex the leg passively the femur jerks forward to its normal position. Once the leg is flexed, and, as was noted before,

there is limitation in the movement of flexion, the patient can voluntarily extend the joint, but as soon as the tibia and femur come into a straight line, the femur dislocates backwards and the knee is again locked. When the knee is extended there is $\frac{3}{4}$ inch of antero-posterior movement obtainable of the tibia on the femur. The radiogram, which is taken with the knee looking directly outwards, shows the backward dislocation of the femur and a degree of tilting of the upper tibial epiphysis; on both sides the shadow of the fibula is covered by that of the tibia.

There is a congenital talipes equino varus on the right side (Fig. 3) which, while it presents fairly typical features of the ordinary congenital club-foot, is quite unusually mobile. The only tense structures in the foot are the tendo Achilles and the tibialis anticus, and all other parts are exceptionally loose and soft, and one has the feeling that if these two tendons were divided the foot would immediately be rendered as abnormally mobile as is the left foot. The tendon of the tibialis anticus is displaced so that it lies almost directly over the internal malleolus. I would lay stress on the point that this club-foot was present at birth, and that therefore the condition cannot be accounted for by secondary and post-natal contractions of muscles, as Haberman suggests in referring to a like condition reported in certain of the English cases.

There is no deformity in the left leg, except that the lower end of the fibula lies somewhat posterior to its normal position and is unusually prominent (Fig. 3).

Co-ordination.—This is apparently unaffected, though movements of the hands appear clumsy owing to the peculiar position of these and of the fingers when an object is grasped.

Reflexes.—The patellar, Achilles, and superficial reflexes are entirely absent.

Movements.—In the hands and fingers there are frequent athetoid movements, which are much more marked when the child is irritated. Haberman describes similar movements in one of his cases and attributes them to "play impulses."

Sensation.—When the sensation is tested with a needle, the child apparently feels even slight pricks quite readily, but makes no attempt to draw the part away. The child herself has a curious habit of seizing hold of the skin of the abdomen and thighs in a way which one would have thought would be painful in a normal person.

Electrical Examination.—Owing to the tendency of the child to struggle, this examination had to be made under a light ether narcosis. Dr. G. D. Mathewson, who was kind enough to test the reactions for me, found that there was no reaction of degeneration present, and that though the responses to the faradic current varied in intensity in different parts of the body and in different muscles of the same limb,
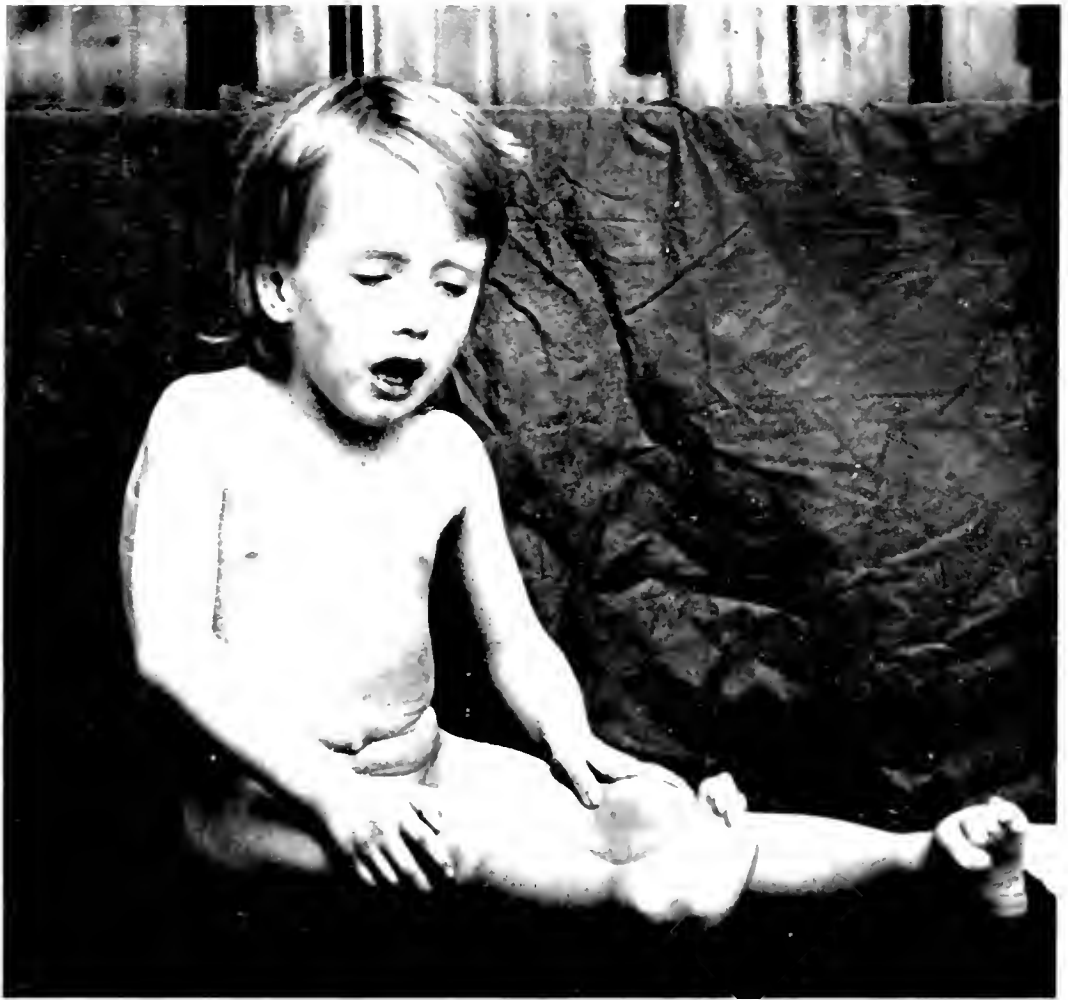
FIG. 1.

Note the comparatively immobile face (child was crying vigorously), drooping of lids, prominence of ribs posteriorly from the scoliosis, lax abdomen, umbilical hernia, partial dislocation of left thumb, shortening and complete outward rotation of right leg, and condition of feet.

FIG. 2.

FIG. 3.

FIG. 4.

Note position of scapulae, also right dorsal curvature of spine.

FIG. 5.

Note left lumbar curvature, dislocation of right
hip-joint and appearance of upper end of
femur with leg in full external rotation.
Inset is drawing of head and neck of femur
taken from another radiogram in which
the knee was looking directly forwards.

FIG. 6.

Note plentiful subcutaneous fat, clear outlines
of muscles and genu recurvatum and
partial backward dislocation of femur on
right side.

all the muscles tested showed a capability of a certain amount of contraction as the result of stimuli of only very slightly greater strength than would be required in a normal child. The responses were for the most part somewhat slower than normal. These reactions it will be noted are exactly similar to those in a typical case of amyotonia.

Progress.—Unfortunately the child has been taken back to Orkney, and its stay in hospital, only a matter of two or three weeks, was not sufficiently prolonged to enable one personally to notice any change in the condition. The mother, who is quite an exceptionally intelligent woman, tells me that the general condition of the child has improved considerably since birth. She has been constantly massaging the parts, and says that the muscular power, especially in the limbs, has improved noticeably. After birth the right knee was kept hyperextended to about 80°, but by means of passive movement, performed with the idea of stretching the contracted quadriceps, and by partial fixation this condition has so improved that only 20° to 25° of hyperextension are now obtainable.

Resume of Case.—*Typical Features of Amyotonia seen in this Case.*—Congenital origin. Hypotonicity of muscles generally: lower limbs more affected than upper. No definite muscular atrophy. Abnormal mobility of joints. Practically normal electrical reactions; no reaction of degeneration. Loss of patellar, Achilles, and superficial reflexes. Sensation little if at all affected. Improvement in condition slow but definite.

Features of this Case only Occasionally Noted in Other Cases of Amyotonia.—Involvement of facial muscles. Difficulty in sucking. Noisy breathing. Athetoid movements of hands. Presence of kyphoscoliosis. Presence of certain contractures and club-foot. Hyperextension of fingers. Slight genu recurvatum.

Features in this Case not, so far as Writer knows, Noted before in a Case of Amyotonia.—Dislocation and malformation of right hip-joint. Congenital genu recurvatum with small patella and backward dislocation of femur. Position of left thumb with partial dislocation. Definite congenital origin and unilateral distribution of certain contractures and club-foot. Umbilical hernia, weakness of upper part of abdomen in the mid-line, and abnormal condition of lower part of sternum. The considerable power shown at times, especially in certain muscles, as the result of an intense mental effort.

It will be seen from this résumé that the conditions found in this case very closely resemble those of myotonia congenita, and that the main points of difference depend on the presence of certain defects and deformities, all of which are either quite definitely or

most presumably congenital. Does the presence of these abnormalities invalidate the diagnosis of myotonia? It is stretching the imagination too far to ask one to suppose that their appearance in the case is merely a coincidence, for the deformities which are present are not such as tend to occur together or to be dependent on one another in a patient who has never walked and who does not suffer from myotonia. In short, I suggest that these deformities are part of the general condition, and not merely superadded. From the 35 cases abstracted by Haberman, and 20 cases quoted by Griffith and Spiller, I find that kyphosis is relatively common. Only one case of scoliosis is noted, and though it is not described the author[8] remarks that it is "doubtlessly congenital"; slight genu recurvatum was found in one case;[9] double club-foot was present in one of the English cases[10] (whether congenital or not is not stated), and one is led to suppose that in other of the English cases there may have been club-feet, as it is remarked that there were "contractions (of muscles) about the ankle and foot." In one case there is said to have been "pouting" of the umbilicus, and in another case there was "atrophy" (? retardation of growth) of the bones of the lower limbs. From these statistics it is evident that deformities, apart from those which are directly due to the condition of the muscles and ligaments, are rare. Whether the bone defects in this case (as in the hip-joint, scoliosis and patella) are due directly to a retarded growth of bone, or whether they are secondarily due to malpositions *in utero* permitted by the general flaccidity of the fœtus, I am not prepared to state, but their presence in a case of this disease makes one wonder whether a slight intra-uterine amyotonia might not be a possible factor in the production of certain of the commoner congenital deformities.

In conclusion I wish to express my thanks to Mr. Hodsdon for his permission to publish this report, to Dr. Edwin Bramwell for many valuable hints he has given me in working up the case, and to Dr. W. B. Gourlay and Mr. Morley for the trouble they took in photographing a most refractory subject.

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LINNAEUS AS A PHYSICIAN.

By HENRY M. CHURCH, B.Sc., M.D., F.R.C.P.

THE only official link that can be found between Linnaeus "the Pole Star of Botany" and Scotland is his election as an Honorary Fellow of the Royal College of Physicians of Edinburgh 140 years ago, an honour which Sweden remembers and appreciates. This was evidenced by that country's desire that delegates from the Royal College should be present at Stockholm on the occasion of the Bicentenary Celebrations of the birth of the great naturalist. This link with the College leads to the consideration of Linnaeus as a physician, a point not often referred to, but worthy of attention.

For some time before Linnaeus became Professor of Botany at Upsala he practised in Stockholm, where he rose to the top of the medical profession. We hear of him curing, with special herbs, Queen Luisa Ulrica, the sister of Frederick the Great, and the "enthroned Minerva of Swedish sciences"; of his having as his patient Gustavus III., who afterwards did so much for the garden of Linnaeus at Upsala; and of his being physician to numerous institutions under the patronage of the throne. In bad cases all had not been done for the patient until Dr. Charles Linnaeus had seen him. In 1738 he wrote to Baron Haller the following letter : [1]—

"I took up my residence at Stockholm. Everybody laughed at my Botany. Not one could tell how many restless nights and toilsome hours I had bestowed on it. . . . I began to set up for a Practitioner, but my success was very slow. They would not even employ me in a servant's cure. But in a short time adversity ceased to persecute, and after many clouded days the lucid sun broke thro' my obscurity. I rose—was called to the great—everything turned out prosperous : no patient could be cured without me. From 4 o'clock in the morning till late at night I visited the sick, spent nights with them, and earned money. . . I renounced Botany, and resolved a thousand times to destroy all my collections for ever. Soon after I was appointed first Physician to the Fleet, and after a short lapse of time the State chose me Botanist to the King, and assigned me an annual salary to teach that science at Stockholm. I now grew fond again of plants, and married my bride, who after five long years still thought me worthy of her love. My father-in-law, however, is dearly fond of money : he does not like to part with it. For my own part I can do without, and thus leave it to my offspring."

It is evident from this letter that he was a very busy practitioner.

Whooping-cough was at this time rampant in Stockholm, for several years the annual death-rate from this disease alone being 2600—an enormous mortality.

We have seen that Linnaeus' great power lay in systematising his great knowledge of details, his enormous capability for work and his intense love for every medical subject giving him a very wide and penetrating outlook, and enabling him to classify disease in a way which had not hitherto been done. Creighton[2] avers that nosology, or the scientific classification of diseases, was initiated by Linnaeus.

He raised many questions, the answers to which were to be worked out years afterwards, many of them being still problems of our own day. We see that he was not unfamiliar with the idea of mutability of type both in animal and plant life.[3] He conceived the idea of new germs and new diseases arising, as new species and varieties of plants arise. His was the first known successful attempt at hybridisation. We see, too, that the evolution theories of to-day were not beyond his range of vision, but his work in botany so overshadowed and followed him that it is only 40 years since Dean Hjelt brought to light his wonderful medical knowledge—a knowledge far in advance of his time—and revealed to the Swedish people the prophetic eye of his genius.

Bacteriology is not a science of yesterday, but dates back to the time of Linnaeus. He clearly expressed the opinion that many diseases are caused by living infectious matter or germs. Among these he mentions dysentery, whooping-cough, smallpox, syphilis, leprosy, consumption, intermittent fever, and plague. He left it for the twentieth century, however, to continue the subject and show, for instance, the relation of rats and fleas to the spread of plague. In the main, present-day investigations prove the truth of many of his prophecies. "Thus, too," he says, "you will find in the end that all fermentation will turn out to be due to living particles." In diseases he sought for parallels between plants and animals. He inferred that as parasitic fungi were known to be the cause of disease in plants, they might also be so in animals, and he found, after close observation, that these germ-caused diseases were influenced in their action by temperature, dampness, subsoil, etc., and that in many respects their development showed some analogy to the manner in which the lower animals increase and spread, statements which seem to lead up to the discoveries made in recent times as to the causes of disease. The nature and origin of this supposed infectious matter was of course very little known

to Linnaeus. With respect to this he says, " Even if these living causes of the exanthematic fevers are not yet found out, more thorough research will show that their formation is much more intricate and complicated that we can now imagine, for this truth is sure, that nowhere is Nature more careful and accurate than in her minutest manifestations."

Talking about his own contributions to medical literature, he says that he himself "acts only like a grindstone, which sharpens but is not itself able to cut." Twenty years before the appearance of Morgagni's great work on pathological anatomy Linnaeus, when director of the Naval Hospital at Stockholm, obtained permission to practise dissection on the cadaver in order to study pathological changes after death, a method of research very little appreciated in those days. Count Mörner[4] says it would be difficult to say whence Linnaeus got this idea. He seems, however, to have expected great results from this research work in relation to his study of intermittent fever, or what we call enteric. Regarding this fever he showed that it was more common on clayey soil, and that from this soil there were greater emanations into the air. Apropos of this is a saying, before the days of antiseptics, of the late Mr. Spence, Professor of Surgery, that "the higher you are the safer you are"; meaning that the higher his ward was the less risk there was of contamination and blood-poisoning from the ground.

Linnaeus puts much value on the study of the pulse. Many papers are devoted to the subject of exercise as a preventive to disease, and contend that exercise is as necessary for maintaining health as food for maintaining life. Cerebral haemorrhage and apoplexy, the disease from which he himself died, are considered at length. We find that while Linnaeus in his first medical work sought for the source of intermittent fevers in the impurity of the water, he propounded in his later work a new theory of their origin, and thought to find their cause in altered conditions of the air and the disturbed functions of the skin arising therefrom.[5]

He opined that the skin through its open pores absorbs the dampness of the air laden with noxious exhalations—that it is not only the united influence of cold and damp in itself, he maintained, which causes disease, but in their combination with exhalations which arise into the air from stagnant water, closed cellars, and particles of decomposing animals and plants. Such air, he thought, must contain a peculiar kind of acid, or particles in process of becoming acid, and that we may conclude from this that not

only animal but nearly all vegetable fluids become acid under aerial influences. He contended that this acidity coagulates the blood and is the cause of disease—a conclusion quite in keeping with the finding of modern science in regard to pneumonia, influenza and allied diseases. Recently, at the request of the Sanitary Association, Professor Thomson has by experiment made the discovery that "thoroughly dried air has a more powerful oxidising influence on the blood than air that has not been dried, and that this effect is increased by heating the air." The fact that heated and dried air has an increased oxidising power over damp air goes far to explain the influence of climate and locality in causing and in curing disease. The benefit of change of air and residence was known to the ancients, and, long before Linnaeus' time, had elicited many attempts at explanation.

In his *Materia Medica* Linnaeus introduces many new medicines which are used by us at the present day. His extensive botanical travels and observations of the habits of the people among whom he sojourned gave him special opportunities in this direction. Thus his tour in Lapland (1737) was particularly rich in materia medica discoveries. Through all his writings on medicines the idea of pharmaco - dynamics of opposing medicinal forces occurs. His meaning is difficult, but it may be gathered that he affixed a distinct medicinal virtue to the odour and other physical peculiarities of his remedies. Probably the value he puts upon odour may be traced back to the influence of flowers placed around his cradle. In Scotland country people, we know, ascribe importance to the taste of their medicines. The Swede believed in stimulating the first or olfactory nerve, the Scot in stimulating the fifth nerve or nerve of taste as an adjunct to the medicine.

Linnaeus was opposed to the use of alcohol but not of tobacco. "In winter we three (Kuhn, Zoega, and Fabricius) lived directly facing Linnaeus' house, and he came to us almost every day in his short *robe-de-chambre*, with a green fur cap on his head and a pipe in his hand." [6]

He pointed out that there is only a difference in degree between a poison and a remedy, and that in suitable cases poisons in small doses are valuable remedies. In his time doctors' prescriptions were long and complicated. The reason for this, perhaps, was the feeling that it would be a hard case if, among so many medicines taken at once, one or other of them could not cure. He says that he who writes long pre-scriptions does so either from ignorance or with a desire to

"swindle." He was the father, therefore, of simple prescribing. He suggests, too, that the words "of great experience" might be put after the name of outstanding physicians as the greatest honour that could be conferred upon them.

Being anxious that the laws of health should be understood throughout the length and breadth of the land by doctors and people alike, Linnaeus lectured much on dietetics and hygiene. He advocated vegetable diet, and cured his own gout by eating strawberries in large quantities. He believed in the infectiousness of consumption, and twice urged that the Academy should offer prizes to the students who could give the best answers to such questions as: "Why is phthisis common, and what is the best cure for it apart from riding?" and "Who can best prove and demonstrate that all infectious diseases are to be attributed either to miasmata or to living animals?" Does he here mean what we call trypanosomes? Thus he tried to sharpen his students' interest in these inquiries in a manner similar to the Research Committees of to-day. His eloquence enraptured and won his pupils, and his enthusiasm became theirs in that very lecture-room which is still to be seen at Upsala, with the motto above the doorway "*Innocue vivito, numen adest.*" Around this lecture-room is the original Botanical Garden in which Linnaeus delighted, and in which he made the greatest part of his remarkable observations. This garden is still in perfect order, and it is interesting to note that it was in it that he and Celsius invented and constructed the centigrade thermometer which now bears Celsius' name. By his genius Sweden obtained a celebrity in science which it has never lost. In all parts of the world Linnaeus became, through his writings and through his pupils, the modern teacher of natural history in its various branches. "While at Therapia in Turkey," says Bjaerstahl, "I saw a Greek in a field who was walking about with a book in his hand," like Christian in the *Pilgrim's Progress*. "I accosted him, and found with astonishment that the book which he held was no other than the *Systema Naturæ* of Linnaeus."

Linnaeus sent his students or "apostles," as they were called, over all the world. Like other "apostles," tragic often was their fate. "But it is grand," says Mörner in his address at Stockholm, "to see how the love of science and devotion to their teacher continually drove new men to face like dangers and troubles." And not only physical dangers and troubles had Linnaeus and his pupils to meet abroad. They had also to hear calumny continually from narrow-minded theologians at home. "He dared not,

as he himself assured me," says his friend at Hammarby, "publish some of his observations on the mysteries of Nature during his life, because he was afraid of the excessive violence of the Swedish divines, who frequently too faithful and too bigoted to their own arguments, do not consider that Nature, as well as revelation, proclaim in unison of principle the hands of that Great Master who formed both." To-day the reader is struck with the reverent and grateful spirit which is displayed in almost all the writings of this great man of science. "The Hand of God," "The Omniscient God," "The Great and Good Creator," are expressions constantly flowing from his pen, and refreshing it is to find true science and such reverence going hand in hand, as they did in Linnaeus' time. In his *Reflections on the Study of Nature* * such sentences as the following occur:—

"This globe may be considered as a Museum, furnished with the works of the Supreme Creator, and disposed in three great classes.

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"Not one of the plants that cover the earth but has its end and office assigned it by the Supreme Governor of the world.

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"The Creator has given us eyes, by the assistance of which we discern the works of creation.

.   .   .   .

"To be an interpreter of the perfect wisdom of an infinite God will by Him be esteemed the highest honour that mortals can attain."

Like most busy men Linnaeus had a hobby, and his was making a collection of the portraits of the great men of his own time. Fortunately there have been preserved to us many portraits of this prince of science himself who was born in Sweden over 200 years ago. His eldest son succeeded him in the University Chair at Upsala. Of his daughters, Sophia, the youngest, was cherished as the darling of his family, and the following extraordinary occurrence may account for this predilection:—She was to all appearance still-born. "No!" said Linnaeus, "she must not, she shall not, die." He pressed her to his bosom, emitting his breath from his mouth into her's, and behold! she revived and lived.

Linnaeus was interred close to the Botanical Garden in the nave of the Cathedral of Upsala. Sacred indeed did the delegates

* Translated from Latin, and printed in 1754 at the expense of the King of Sweden.

feel that flagstone to be on which were engraven in deep letters the Latin words "*Ossa Caroli von Linne.*"

REFERENCES.—[1] Stoever, *Life of Linnaeus*, Lond., 1794, p. 19. [2] Creighton, *History of Epidemics*, Camb., 1891-1894. [3] Mörner, *Life Story of Linnaeus*, p. 12. [4] *Ibid.*, Address. [5] *Linnaeus as the Physician*, p. 83. [6] Stoever, *op. cit.* p. 274.

REPORTS OF SOCIETIES.

Medico-Chirurgical Society of Edinburgh.

A MEETING was held on 7th May 1913, Mr. J. M. Cotterill, President, in the chair.

Dr. H. M. Traquair read a *Contribution to the Study of Bitemporal Hemiopia.* Two chief types were to be distinguished, the scotomatous and the non-scotomatous. In the former there was a scotoma occupying part or all of the area between the fixation point and the blind spot, associated with a varying degree of defect of the temporal field. Very delicate tests were required. Small objects and a variety of objects should be employed. In this type of case the vertical mesial border and the distribution of density served to distinguish the condition from tobacco amblyopia. The peripheral borders might be normal while the nasal borders were curtailed. There might be splitting of the field of vision, the outer part being relatively preserved. The loss of vision progressed regularly in the sequence—upper and outer quadrant, then lower and outer, lower and inner, then upper and inner. There was great power of recovery in these cases, even when a pituitary tumour was present.

In the non-scotomatous type delicate tests were again required. There was often a slight gradation from very slight defects to definite loss of vision in the upper and outer quadrant. The colour fields came nearly up to the white, indicating that the lesion was not so acute. Present statistics indicated that there was hemiopia in only 50 per cent. of cases of acromegaly. In all the cases Dr. Traquair had examined there had been defect of vision, and he had no doubt it would commonly be found if delicate enough tests were employed. The actual lesion which produced scotoma was probably a condition similar to bulbo-neuritis affecting the chiasma.

Dr. Sym remarked that the defect of vision by the junction of four quadrants was a point of great interest.

Dr. Paterson said that the technical difficulties in carrying out observations on the field of vision were enormous. He did not think the cases which recovered could be accounted for by pressure. Vascular changes or œdema were much more likely to account for the defect of vision. Cases of blindness following actual pressure very rarely recovered.

Dr. Sinclair said that Bjerrum's screen method was invaluable for charting the fields of vision, but it was very laborious and required much technical knowledge.

Dr. J. S. Fraser said that many cases of hemiopia associated with nasal disease had been reported. He had seen such cases, but they seemed to recover both with and without operation, and it was difficult to ascertain their relationship. He suggested localised meningitis as a possible cause.

Dr. Eason recalled the pituitary enlargement that follows thyroidectomy, and thought it reasonable to administer thyroid in cases due to pituitary hyperplasia.

Dr. Lewis Thatcher read a paper on "Congenital Defect of Abdominal Muscles, with Anomaly of Urinary Apparatus," which will appear in the *Journal*.

RECENT ADVANCES IN MEDICAL SCIENCE.

NEUROLOGY.

UNDER THE CHARGE OF

EDWIN BRAMWELL, M.B.

THE SYMPTOMS PRODUCED BY CERVICAL RIBS.

WITHIN the last few years the symptoms which may be produced by cervical ribs have attracted considerable attention. The condition is by no means infrequent; the abstractor has himself met with 7 cases, 4 of which were submitted to operation. The subject was very thoroughly considered in all its aspects at a recent meeting of the Clinical Section of the Royal Society of Medicine. Dr. F. Wood Jones introduced the sederunt with an anatomical paper.

Developmentally it would appear "that the ribs are shorn from the neck region (and from the loins) by the straining of the nerves across the mesoblastic basis in which they would be laid down." The ribs present marks in places which are produced by the pressure of the nerves during embryonal life, an obvious instance being the groove on the upper surface of the normal first rib, for long believed to be due to pressure of the subclavian artery, but which is really caused by the lower cord of the brachial plexus. The nerve groove upon cervical ribs has been described by many observers, the anterior or outer limit of this groove usually corresponding with the distal termination of the cervical rib, from the tip of which a ligamentous structure passes to the first rib or sternum. It is well known that the brachial plexus is subject to variations, and that in some instances there may be a larger contribution from the lower and in others from the upper roots which comprise the plexus; while, again, in other cases nerves normally outside the range of the plexus take part in its formation. Wood Jones has found that the depth of the groove on the dorsum of the first rib is correspondingly greater if the contribution from the first thoracic nerve is unusually large, and that in some cases the rib is actually bent down at the seat of crossing. He argues that the tension between the first rib and the lower cord of the plexus as it hooks over it is in consequence increased. In proof of this assertion he quotes a case in which a brachial neuritis

appeared to be the result of pressure, and yet no cervical rib was seen on X-ray examination. Operation was undertaken, and a portion of the first rib excised, when the pain previously present rapidly disappeared. The abstractor has met with 2 similar cases, in both of which Mr. Stiles removed a portion of the first rib, with relief of the symptoms.

When the second dorsal nerve in whole or in part becomes added to the plexus the first rib is curtailed, and presents a striking resemblance to a cervical rib. Such rudimentary first ribs have been repeatedly described by anatomists. Wood Jones believes that it is almost certain that some forms of rudimentary first ribs, and these abortive first ribs are not recognised clinically, would produce symptoms similar to cervical ribs, and that it is extremely probable that many such cases are included in the records of cervical ribs. He also points out that when the cervical rib is well developed there is a tendency for the plexus to be prefixed ; in other words, for it to receive either no contribution or only a very small one from the first dorsal root. This anatomical observation coincides with Lewis Jones' statement that " where the bony prominence can be felt with ease the brachial plexus is usually free from pressure." Finally, the author concludes that it is when the development of the costal process is in excess of the plexus alteration that the strain is produced and symptoms are developed.

The normal relation of the subclavian artery to 7th cervical ribs is still a matter of some uncertainty, although Todd has shown good reason for believing that it is not pressure upon the subclavian artery but upon the vasomotor fibres in the lower cord of the plexus which is responsible for the vasomotor symptoms met with in some cases of cervical rib. The reason why the symptoms of neuritis develop in early adult life and are more frequent in women than in men is to be found, according to the writer of the paper, in the tendency for the shoulder-girdle and arm to drop back in adolescence, and the greater dropping of the shoulder in the female. The observation that symptoms are apt to develop in people who show loss of muscular tone is to be accounted for in the same way.

From the foregoing remarks it will be readily understood that it is of great importance that the radiologist should be able to distinguish the vertebra from which the rudimentary rib arises. Unless this can be done it will be practically impossible to distinguish between a cervical rib and a rudimentary first dorsal rib.

Mr. William Thorburn opened the debate from the surgical side. He grouped the cases demanding operation into (1) those in which the rib might be removed on account of deformity ; (2) those in which operation might be done for the relief of the vascular symptoms; and (3) those in which operation might be done for nerve symptoms. His personal experience of operation was limited to cases in which nerve

symptoms were present. As showing that the artery may be subjected to pressure, he pointed out that when the pulse is markedly diminished it can be rapidly restored either by raising the arm or by removing the rib.

The cases presenting nervous symptoms he divided into 2 groups —the neuralgic and the paralytic. He did not think operation was indicated for pain alone unless this symptom was severe. He had not seen a "paralytic" case which showed any tendency to recover under treatment short of operation, but he had seen cases of long standing entirely crippled by being allowed to go untreated. A long incision straight down and well back in the neck was that which he favoured, the only important structure to avoid by this incision being the suprascapular nerve.

On analysing 14 cases upon which he had operated, and 6 operated on by some of his colleagues, this number including no case of less than a year's duration, he would say that all were greatly improved. Pain, which was present in all, was completely cured in 12 and relieved in 3, while 5 were lost sight of. Paralysis noted in 12 was completely cured in 5, greatly relieved in 5, and 2 were not traced. He had never been able to satisfy himself that atrophy was ever entirely cured. Tactile anæsthesia could be practically always cured, but the sense of coldness and interference with temperature sense were apt to remain in the majority of cases. A transient paralysis of the brachial plexus followed operation in 1 case ; in 1 there was a definite paralysis of the suprascapular nerve which cleared up in three months ; in 2 cases in which the pleura was opened the consequent ill-effects were completely recovered from in a fortnight. The first rib had been removed in one of his most successful cases ; in 2 cases a small sinus burrowing deeply in the neck had continued to discharge for a year and eighteen months respectively after operation.

Mr. Percy Sargent, continuing the discussion, after referring in some detail to the anatomical data and the mode of causation of symptoms, remarked on the little importance to be attached to the size of the bone as shown by X-ray examination, and said that a negative report from a radiographer would not deter him from operating where the symptoms were those of cervical rib. He had operated on 29 patients with cervical ribs, in 5 of whom both sides were dealt with. On analysing his cases he found that 26 were females and only 3 males, and that the average age was 38·7, the youngest patient being 13, the eldest 62. The earliest symptom was in 17 pain, in 5 numbness, in 3 clumsiness in the fingers, and in 4 swelling or coldness of the hand. The average interval between the onset of symptoms and the operation was over three years, the extremes being one month and fourteen years, while the symptoms for which the patient sought relief were in 4 cases pain alone, in 9

pain and wasting, in 6 pain and numbness, in 5 wasting and numbness, and in 5 wasting alone.

As to the technique of the operation itself, Sargent lays stress on the gentle handling of all the tissues. When the bony rib is very short it is only necessary to divide the ligamentous band. The superficial branches of the 3rd and 4th cervical nerves must be most carefully preserved, for if divided there may be permanent pain in the area of their distribution. Speaking of his results, Sargent says that the immediate result was bad in 2 cases, a fairly complete paralysis of the upper limb occurring, which had not completely disappeared six months later. This was no doubt produced by bruising of the nerves in one case, while in the second case an hysterical monoplegia of the limb ensued, for which the patient refused treatment. The most satisfactory cases are those in which pain is the prominent feature.

Dr. Hinds Howell spoke of the results of operative treatment in 25 cases in which 30 operations were performed, 20 of these by Mr. Sargent. In 18 cases pain was complained of as an immediate effect of the operation. As a rule this lasted for from one to three months, but in 4 the pain persisted for various periods from one to seven years. Fifteen patients showed motor symptoms, usually weakness of the whole arm, lasting from two weeks to three months. In 4 cases the symptoms were more pronounced; thus 2 patients had a flaccid paralysis of the whole arm, lasting for three or four months respectively : one patient had paralysis of the serratus magnus with incomplete recovery after a year ; while one patient had paralysis of the deltoid and of the muscles supplied by the median nerve, the deltoid recovering, but the hand muscles remaining atrophic. In only 12 instances was there absolutely no motor or sensory disturbance following operation.

Howell summarises the result of operative treatment in these cases as follows :—"In a large proportion of cases some symptoms, such as pain and weakness in the arm, may be expected to follow the operation, but not to last more than three months or so. The vasomotor symptoms which are present in almost all the cases will be certainly improved, and in the majority of cases pain will be relieved or cured. With regard to muscular weakness or atrophy the expectation is that the operation, if it is not too long delayed, will greatly improve this condition. There is not, as a rule, complete restoration of the wasted muscles, nor complete recovery from the vasomotor disturbance."

Dr. S. A. Kinnier Wilson, who devoted his remarks to some points in the symptomatology of cervical rib, with special reference to muscular wasting, observed that in the majority of cases the patient complains of tingling, numbness, pins and needles in the hand and fingers, often in the finger-tips, and very frequently referred to the ulnar or radial side of the hand. In most cases the paraesthesia is unilateral. Pain usually described as shooting or darting was commonly experienced in

the forearm, hand, or fingers. There may be no definite alteration in cutaneous sensibility, while in other cases there is a diminution or loss of all forms. The anæsthesia in its distribution never exactly corresponds to that of the ulnar or radial nerve, nor exactly to a root supply.

When motor phenomena occur two main types are recognisable; in the first type there is wasting of the abductor pollicis and opponens pollicis, all the other muscles being intact. It is worthy of note in relation to diagnosis that although the median nerve supplies the abductor, opponens, and flexor brevis pollicis, the atrophy is limited to the first two muscles in cases of cervical rib. Again, in progressive muscular atrophy the thenar eminence is affected as a whole, while the selective atrophy met with very often in cervical rib never occurs. The occasional presence of sensory change along the radial border of the wrist, an area supplied by the 6th cervical rib, is probably to be explained by the circumstance that in these cases the plexus is of the prefixed type. In the second type there is wasting of the interossei and an approximation to the *main en griffe*. The paræsthesia in most of these cases is referred to the ulnar border of the hand and ulnar fingers, whereas in the cases offering the local thenar atrophy of the first type the paræsthesia is on the radial side.

Dr. Farquhar Buzzard referred in his remarks to cases occurring generally in middle-aged women who complained that soon after going to bed they woke with intense burning pain in the hands and fingers. When they got up in the morning their hands felt useless and clumsy, but after a time this would improve, and the patient be able to carry on her work throughout the day, the pain and discomfort returning again at night. In several cases of this kind there were distinct cervical ribs, and in one such case Mr. Sargent had operated and given the patient ·relief. He emphasised the importance of occupation and posture as etiological factors, a point mentioned by several of the previous speakers.

Sir Rickman Godlee advocated a sufficiently long transverse incision above the swelling, and first exposing the upper part of the brachial plexus without thinking about the rib. He thought that the troubles that have been experienced must have come from making a vertical incision and from attempting to work straight down on the rib by separating the cords of the plexus. E. B.

SURGERY.

UNDER THE CHARGE OF

J. W. STRUTHERS, F.R.C.S., AND D. P. D. WILKIE, F.R.C.S.

Myositis Ossificans Traumatica.

COLEY (*Annals of Surgery*, March 1913) reports three cases of traumatic ossifying myositis, and discusses the differential diagnosis from sarcoma.

That a very real difficulty exists in making the diagnosis is clearly shown by the case histories. The first case was that of a lad of 19, in whose thigh a swelling developed after an injury received while playing football. After increasing in size for a time the swelling began to contract and get hard. A number of surgeons examined the case, diagnosed sarcoma, and advised amputation. On examining the patient Coley found a very hard tumour on the front of the femur. The X-ray picture showed it to be bony in nature, and that there was a sharp line of demarcation between the periosteum and the swelling. A portion was removed for examination, and showed well-formed bone without signs of sarcoma. A diagnosis of myositis ossificans was made, and no operative treatment carried out. Five and three-quarter years later the patient was in good health, and the tumour had undergone a certain amount of absorption. The second case was one in which a small bony enlargement was found on the femur two years after a severe contusion of the thigh in a woman of 26. Again amputation was advised before Coley saw the patient, and again he diagnosed myositis on the same grounds as in Case I. The patient remained well for more than two years, when the tumour began to grow, and ultimately developed into a sarcoma, gave rise to metastases, and killed the patient. The third case was practically identical with the first.

On the basis of these three cases Coley discusses localised myositis ossificans following a single trauma. The exact origin of the bone formed is still a matter of dispute, some regarding the condition as a tumour formation, ossifying myosteoma, others as a development from separated pieces of periosteum or bone. The chief point of interest in this connection is that Coley's second case is the only one on record where an apparently typical myositis ossificans developed into a sarcoma. From the clinical point of view perhaps the most important aspect of the condition is the difficulty in distinguishing between it and sarcoma. Coley has found the following points of value in making a diagnosis:— The consistence of the swelling in myositis ossificans is much harder than is usual in sarcoma, and this hardness is uniform all over, whereas in sarcoma variations in consistence are usually present. Pain is usually a marked feature in the early stages in myositis, tending to lessen and disappear in the later stages, while the converse is the case in sarcoma. Interference with the movement of a neighbouring joint is found early in myositis, and is seldom noted in the early stages of sarcoma. The X-ray picture shows the outline of the periosteum clearly marked without indentations in myositis, a feature rarely found in sarcoma. In the only case of sarcoma where Coley has noted this apparent freedom of the periosteum the tumour was an extremely rapidly growing one without any history of injury. While Coley believes that the clinical history and a consideration of the above features will usually enable

a correct diagnosis to be made, he is strongly of opinion that an exploratory operation should be done to determine, if possible with certainty, the nature of the swelling, and as the result of his experience he does not agree with those who hold that the removal of a portion of a sarcoma for diagnostic purposes is a harmful proceeding, except perhaps in cases where the tumour is particularly inaccessible, making the procedure a complicated one. As regards treatment, it is not possible to lay down hard-and-fast rules, but Coley believes that a distinction should be made between cases in which the condition develops along the shaft of a bone and those in which it is close to a joint. In the latter the condition is often associated with what he terms an ossifying peri-arthritis, which greatly affects the operative prognosis for the worse. Removal of the swelling when it is on the shaft of a bone remote from a joint is followed by better results, but it is noteworthy that good results often follow when nothing is done, as the swelling may decrease and function be restored, so that some time may safely be allowed to elapse in order to test the natural powers of recovery. The paper is copiously illustrated by X-ray and other photographs.

The Embryogenetic Relationships of Tumours of the Kidney, Suprarenal, and Testicle.

Wilson (*Ibid.*, April 1913), writing from the Mayo clinic, reports the results of the examination of 92 kidney tumours, 3 suprarenal tumours, and 21 testicular tumours. He groups the renal tumours into (*a*) tumours of the pelvis and collecting tubules, (*b*) tumours of the cortex, and (*c*) tumours of the capsule. Those of the pelvis seem to be secondary to chronic irritative processes of the pelvic epithelium, and develop as papillomas and carcinomas. Among the 92 tumours examined 3 papillomas and 4 carcinomas, all apparently secondary to irritation, were found, while one squamous-celled carcinoma of the pelvis was presumed to be developmental in origin and ascribed to an inclusion of ectodermal cells from the lower end of the primitive excretory duct by way of the cloaca. Tumours of the cortex are in the great majority of cases mesotheliomas—so-called hypernephromas. Seventy-one of the 92 tumours were of this nature. Wilson agrees with those who no longer believe that these tumours are derived from suprarenal rests. He cites and agrees with Stoerck's objections to the alleged suprarenal origin as follows :—The tumours usually develop at the lower pole of the kidney, where rests are not found ; the so-called fat of the tumours is not really fat, but a vacuolation of the cells ; the tumour is one of the cortex and not of the capsule, where rests are found ; the cordons of cells in these tumours only remotely resemble those of the suprarenal, and there are invariably found tubules, the analogues of which are never seen in the normal suprarenal or tumours

of that gland. Wilson's view is that these tumours are derived from islands of nephrogenic tissue which have failed to connect with the collecting tubules and pelvis of the kidney.

Tumours of the renal capsule take the form of fibromas or spindle-celled sarcomas. One fibroma and two sarcomas, all in adults over 35, were found in Wilson's cases. Three specimens of suprarenal tumours were examined, and in all the structure was easily distinguished from that of the renal tumours, thus affording additional evidence of the separate origin of renal and suprarenal growths. Of the 21 testicular tumours 19 were examined in detail, and all proved to be teratomas. So far as could be determined, the appearances harmonised with the view that these teratomas arise from sex cells whose normal development has been suppressed. The difference in time of development of the embryonic crop of genitaloid cells and the next generation which appears at puberty may account for the variations in structure and date of appearance of testicular teratomas.

Consecutive Displacement of the Cerebral Hemisphere in the Localisation and Removal of Intra-cerebral Tumours and Hæmorrhages.

Under the above title Hudson (*Ibid.*) describes the technique which he at present adopts in doing craniotomy. The essential feature of his methods consists in making very large openings either in the parieto-occipital region or the frontal region, so that room is made for the backward or forward displacement of the corresponding cerebral hemisphere by the increased intra-cranial tension present in cases of tumour or hæmorrhage. He has been led to adopt this plan by noting the damage done to the brain when it is forced by the increased tension against the edges of an opening of ordinary size. He describes a case, for instance, in which great damage was done by the edges of an opening where the legs of the bone-flap measured as much as $3\frac{1}{2}$ inches, and where a two-stage operation was contemplated. The case was one of cerebral tumour, and it was expected that the tumour, which was subcortical, would be forced towards the opening after the pressure was so far relieved by making an osteoplastic flap and dural opening. The patient died 48 hours later, and examination of the brain showed the great damage done by the pressure against the bony edges, owing to the insufficient room provided for expansion of the brain.

In order to obviate such occurrences Hudson proceeds as follows, say in a case where a tumour in the motor area has been diagnosed : First a flap of ordinary size is turned down, and when no tumour is found a second flap releasing a very large area of bone, posterior to and contiguous with the first flap, is made. In this way room is provided for the entire hemisphere to bulge backwards, so to speak, without fear of its being squeezed against the edges of the bone

opening. The tension is widely distributed by this manœuvre, and a subcortical tumour is much more easily palpated and found. Where a tumour is found irremovable the flap is replaced and anchored loosely by what Hudson terms expanding silver wire sutures, *i.e.* tied so loosely as to allow for expansion. Similarly, large openings may be made in the frontal region when the location of a tumour is in the anterior part of the brain. Large bone flaps are best cut, according to Hudson, by making a number of openings with a burr, and joining these by using strong cutting forceps, a method which limits the hæmorrhage, as the forceps crush the bone sufficiently to close the vessels and prevent bleeding. Special instruments devised by him for the purpose are figured and described. The paper is illustrated by numerous figures showing the extent of the openings made.

<div align="right">J. W. S.</div>

INTRA-PHARYNGEAL ANÆSTHESIA.

Karl Connell (*Journ. Amer. Med. Assoc.*, 22nd March 1913) describes a new method of etherisation now in use at the Roosevelt Hospital, which seems to possess some of the advantages of intra-tracheal anæsthesia, while not entailing the passage of a tube into the trachea. The ether vapour is supplied from a vapouriser which registers not only the percentage of ether in the atmosphere coming from it, but also the total volume and the pressure in mm. Hg of the air passing through it. A small catheter (16 F.) is passed down each nostril, so that the open end rests in the lower part of the pharynx on a level with the epiglottis. The distance from the anterior nares to this point may be ascertained in any case by measuring the distance from the ala nasi to the external auditory meatus. The ether vapour is pumped into the pharynx through the catheters. It is of the essence of the method that the volume of ether-laden air supplied shall be slightly in excess of the respiratory needs of the patient. If this be attended to, no air will be inspired through the mouth, thus ensuring that the vapour reaching the lower air-passages is of the full strength supplied by the vapouriser, and also that a constant stream of air and ether flows over the entrance to the larynx from behind forward. No secretion or blood from the mouth can therefore be inspired, and liability to obstructed breathing from all the usual causes is obviated. This freedom of respiration, combined with the supply of vapour of constant strength, gives an anæsthesia as ideal as the intra-tracheal method. If it be necessary to use positive pressure the nares can be clamped round the catheters, the larynx gently pressed backwards against the œsophagus, and the lips slightly approximated by the fingers of the anæsthetist. A pressure of from 5 to 25 mm. Hg can thus easily be produced, and will be instantly indicated by the manometer attached to the vapouriser. Connell mentions the percentage strengths of ether he finds necessary, which in the average

case vary from 18 during the first five minutes to 8 at the end of a long case; 14 per cent. usually suffices for maintenance of anaesthesia during first half hour.   J. S. R.

OBSTETRICS AND GYNECOLOGY.

UNDER THE CHARGE OF

A. H. F. BARBOUR, M.D., AND J. W. BALLANTYNE, M.D.

HYPEREMESIS GRAVIDARUM.

ONE of the most important matters in connection with the treatment of the grave vomiting of pregnancy is the differential diagnosis of the variety—neurotic, reflex, or toxaemic—which is present in any given case. Some years ago Professor Whitridge Williams believed that the toxaemic type was always accompanied by an increase in the proportion of the total nitrogen excreted through the kidneys in the form of ammonia. In normal pregnant women this so-called ammonia co-efficient varied between 3 and 5 per cent., but in cases of toxaemia it rose markedly; and Williams thought that a rise to 15 or 20 per cent. indicated the necessity for the prompt termination of the pregnancy. If in cases of pernicious vomiting of pregnancy the ammonia co-efficient was normal, the conclusion was to be drawn that they were either of the neurotic or the reflex variety, whilst if it was markedly elevated the toxaemic type was present. Of course this differentiation in diagnosis would be followed by a similar differentiation in treatment; and, as a matter of fact, Professor Williams found at once a marked reduction in the number of cases requiring induction of abortion. Recently, however, he has had to admit (*Trans. Glasgow Obstet. and Gynae. Soc.*, vol. ix. pp. 94-117, 1913), in his presidential address to the Glasgow Obstetrical and Gynaecological Society, that a high ammonia co-efficient in pregnancy may not necessarily indicate the existence of a specific toxaemia. A condition of profound inanition may reveal a high ammonia co-efficient, indicating, in all probability, the presence of a starvation acidosis; and, further, the same result may be observed in delayed chloroform poisoning. It is necessary, therefore, to be able to exclude these two conditions before one can regard the case as one of pernicious vomiting of the toxaemic type, for obviously the extreme inanition of a neurotic vomiting may raise the ammonia co-efficient. Whitridge Williams, therefore, has modified his test to some extent, and has raised the percentage required to establish a diagnosis of toxaemic vomiting. He now states the matter as follows: For clinical purposes we can regard a given case as toxaemic in origin whenever a seriously ill patient, presenting a high ammonia co-efficient (20 per cent. or more), fails to improve after a few days' complete rest in bed, combined with suggestive treatment, energetic rectal feeding, and the administration of large quantities of salt solution per rectum

and beneath the skin. Furthermore, says Dr. Williams, the appearance of coffee-ground vomit, well marked icterus, and a semi-comatose condition justifies an almost positive diagnosis, provided chloroform has not been administered as an anæsthetic : and, if death ensues, characteristic hepatic and renal lesions will be found at the autopsy.

But, even if we are forced to admit its lessened diagnostic importance, the high ammonia co-efficient test is still a valuable one. It is always a danger-signal in pregnancy, and with due precautions and reservations it may be employed as a means of separating off the toxæmic from the other two forms of hyperemesis. It is particularly important to remember that a low ammonia co-efficient (in the absence of genital lesions, such as uterine displacements) indicates neurotic vomiting, and this, as Dr. Whitridge Williams has shown, can be cured by suggestion and dietetic treatment, no matter how ill the patient may appear.

Professor Whitridge Williams' work is only one of several indications that the mind of the profession is exercised regarding the use of the induction of abortion as a means of treating the pernicious vomiting of pregnancy. There is evidently a tendency to try to restrict it to the purely toxæmic cases, and to as few of these as possible. The reason is not difficult to find. Obviously to cure a morbid pregnancy by killing the pregnancy itself is not the highest form of treatment, and resembles the termination of a cancer patient's existence in order to check the progress of the malignant growth. Dr. G. Fieux (*Ann. de gynéc. et d'obstét.*, ann. xxxix. p. 718, December 1912) calls this kind of treatment "ultra-radical," and the performance of therapeutic abortion, as it is somewhat euphemistically named, a "cruel necessity" : and Dr. Herrgott of Nancy (*Ibid.*, ann. xl. p. 69, February 1913) terms it the "therapeutic of despair." But Dr. Fieux goes further than Dr. Whitridge Williams, for even in cases of true toxæmic hyperemesis he does not resort to the induction of abortion until he has tried serotherapy. In three cases he has had success from the treatment of pernicious vomiting by the hypodermic injection of serum from a healthy woman in the early months of pregnancy. The rationale of the procedure is that in the early months antibodies are developed in the blood in response to the chorionic antigens, and that these antibodies are needed for the neutralisation of the toxines existing in the blood of the patient suffering from hyperemesis. In two of Fieux's patients the satisfactory result seemed fully to bear out this view, but in the third case no human pregnancy-serum was available, and horse's serum was used (followed later by serum from a healthy pregnancy), with an equally good result. But, further, in a fourth case, nothing but the horse-serum was employed, and again a cure was effected. This is rather a puzzling thing, and Dr. Fieux does not see his way to an explanation : but it is to be noted that Freund of Berlin had a

similar experience in connection with the toxic dermatoses of pregnancy, obtaining success in three cases with the serum of an early normal pregnancy, and in a further series of cases with the serum of a horse alone. Success in the vomiting of pregnancy from the injection of serum from healthy pregnant women has also been recorded by Dr. Oui and by Dr. Le Lorier (*Ann. de gynéc. et d'obstét.*, ann. xl. p. 123, February 1913); but Professor Pinard has thrown out a necessary warning when he counsels the careful elimination of even the slightest suspicion of syphilis in the case of the pregnant woman from whom the serum is obtained. Certainly any patient whose blood is to be used for the purpose of serotherapy ought to be tested for the Wassermann reaction.

These reports are encouraging, but unfortunately other obstetricians are unable to record successes. Professor W. Rubeska of Prague (*Zentralbl. f. Gynäk.*, vol. xxxvii. p. 307, 1913) has tried the serum of a normal pregnancy in two cases of serious vomiting of gestation. One patient was a quadripara of 31 years of age, who had in a previous pregnancy had to have induction of abortion performed for hyperemesis. She was again pregnant, and suffering from vomiting. The uterus was found to be retroflexed, and Dr. Rubeska replaced it, but the vomiting continued. Various other means were tried, such as salines, thyroid tablets, pantopon, and codein, but without result. Then 10 c.cm. from a healthy pregnancy were injected into the gluteal region, but the vomiting continued as before. On the following day 29 c.cm. were injected intra-muscularly, but with no improvement. Finally, as the patient was rapidly growing worse, the cervix uteri was dilated by means of a laminaria tent and Hegar's dilators, and the uterus emptied of the gestation sac. Recovery then took place. The second patient had had an abortion and a pregnancy terminated at the second month for hyperemesis. She was pregnant for the third time, and was vomiting again. Dr. Rubeska injected 10 c.cm. of normal pregnancy serum into the right median vein, with no result; two days later a second dose of 10 c.cm. was given, along with 20 c.cm. subcutaneously, and these doses were followed by improvement; but in six days the vomiting was again severe, and although 55 c.cm. were given intra-venously and 15 intra-muscularly, it was necessary in the end to empty the uterus. Nine days after the induction of abortion she was quite well. Dr. Rubeska is not using exaggerated language, therefore, when he comes to the conclusion that normal pregnancy serum cannot be regarded as a certain curative agent in hyperemesis.

In Professor Rubeska's first patient it will have been noted that there was also a retroflexion of the uterus, and that its correction was not followed by cure; so that we are led to the conclusion that hyperemesis may be associated both with a toxaemic and reflex cause. Generally speaking, however, the detection of a uterine displacement

in a case of hyperemesis is a hopeful circumstance, and Dr. A. Herrgott's observation (*Ann. de gynéc. et d'obstét.*, vol. xl. p. 65, 1913) is an illustration thereof. Herrgott quotes Graily Hewitt for the statement that out of 89 cases of hyperemesis there will be 19 in which the cause is a displacement of the uterus, and in which its correction will stop the sickness. The case which he reports is a very instructive one. The patient was 29 years of age, and in her first pregnancy. She had enjoyed good health, but believed herself to be of a very nervous temperament. She began to vomit at the end of the second month of her pregnancy, and became rapidly so ill that her medical attendant sent her into the Maternity Hospital at Nancy, to have induction induced by Dr. Herrgott. The last named, however, made a vaginal examination, and discovered a retroverted uterus, which he easily replaced. The vomiting ceased, and the patient improved; but, to Dr. Herrgott's great disappointment, in four days she began to vomit again, and was soon as seriously ill as before. A second examination was made, when it was discovered that the womb was again out of its place, and to a more serious degree than at first: there was now a retroflexion, and the organ was somewhat incarcerated in the pelvis. Dr. Herrgott, by putting the patient in the genu-pectoral position, succeeded in once more replacing the uterus, and he now secured it in its proper place by means of a pessary. There was now no further vomiting, and the patient was able to leave the hospital nineteen days later in good health, and with the pregnancy going on.

Dr. Herrgott's case is a most instructive one. The apparent failure of the treatment by uterine replacement would have led a less careful operator to the conclusion that the case was really one of toxæmic and not of reflex hyperemesis, but the second examination revealed the true cause of the failure, and enabled a happy result to be obtained. The writer, however, does not deny that sometimes a uterine displacement may co-exist with toxæmia as causes of excessive vomiting, and he therefore warns the obstetrician against thinking that because he has found a displacement and corrected it all will necessarily go well. If vomiting continue, then a toxæmic condition is to be suspected, and therapeutic induction of abortion may be absolutely necessary, and ought not to be long deferred.

Dr. Max Sperling (*Zentralbl. f. Gynäk.*, vol. xxxvii. p. 55, 1913) has put on record a curious case of hyperemesis of pregnancy, followed by what seems to have been describable as hyperemesis of the puerperium. The patient was 23 years of age, and suffered from excessive vomiting in the first three months of her pregnancy, but then she aborted spontaneously, and the vomiting became less severe, but did not stop altogether. Three weeks after the miscarriage she suffered from a sharp hæmorrhage from the uterus, requiring a curetting. This was followed by cessation of the bleeding and also of the vomiting, till the

patient rose (on the sixth day), when the vomiting returned, persisted for three or four months, and then became so severe as to justify its description as "uncontrollable." The uterus was found to be retroverted and somewhat small. A second curetting was done, and then, at length, the vomiting ceased. The case is difficult of explanation, but the uterine displacement must be looked upon as one of the causal factors, and one cannot help thinking of a neurotic element as another.

The case of hyperemesis with a uterus septus, recorded by Drs. Wellington Yates and Plinn F. Morse (*Amer. Journ. Obstet.*, vol. lxvii. p. 347, February 1913), must be regarded as one of the curiosities of the pathology of pregnancy. The woman was three and a half months pregnant, and was suffering so severely from vomiting that her medical attendant emptied the uterus. She immediately became seriously ill, with symptoms pointing to diffuse peritonitis. Examination showed a double uterus, and pyometra of one horn was diagnosed. Colpotomy was performed, and the patient recovered. J. W. B.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

W. G. SYM, M.D., F.R.C.S., AND ANGUS MacGILLIVRAY, M.D., D.Sc.

Nystagmus Retractorius.

THIS is a condition described by Professor Elschnig of Prague (*Med. Klin.*, i. 1913) in which, on voluntary movement, the globe is also drawn back into the orbit, while the pupil remains unaltered. He attributes this peculiar lesion to pressure-interference with the nuclei of the ocular nerves in the floor of the aqueduct of Sylvius, or to their connections; the recti, in his opinion, have an overpowering influence as compared with the obliques. In one case, of which some details are given below, there was also apparent convergence, but this Elschnig considered to be due merely to the relatively overweening action of the two interni, which are much more powerful than the externi, and not to be a true convergence.

The case to which reference is made was that of a girl of 21, who had no symptoms so far as could be ascertained until, finding herself, to her distress, in a pregnant condition, she had swallowed a bottle of "Jerusalem Balsam" with the view of procuring abortion. She did not succeed in this endeavour, but in a week vision began to fail, and before a fortnight had gone she was practically blind. When seen by Elschnig she was an apparently healthy-looking young woman, eight months pregnant, lying in bed in a very apathetic or torpid state, hardly replying to questions unless they were put sharply, and even then only in a slow, hesitating way, as though she were searching for the correct words. Besides the eye symptoms indicated above there was a very bad condition of choked disc in each eye, with marked

"albuminuric retinitis changes" at the macula, but with no hæmor-
rhages. The tongue was put out straight, active and passive move-
ments of the limbs were of fair power, the knee-jerks were present,
there was no ankle-clonus, Babinski's sign was negative, and there were
no contractions and no localised atrophies. Elschnig was of opinion
that there must be a tumour in the immediate proximity of the
aqueduct, and an operation was performed for her relief. Trephining
revealed the presence of a large quantity of fluid (80 c.c.) distending
the ventricles, and when this fluid was drawn off there was an instant
improvement in the condition of the patient, who had been so phlegmatic
as not even to require an anæsthetic. She cast off her apathy, ex-
claimed that she could see again, discussed the symptoms with the
doctors in attendance, and was in fact "a different being." Unfortun-
ately this improvement was only very temporary, and in a few days
the temperature began to run up, but without meningitis, and the
patient died. Post-mortem a tumour the size of a hazel nut was
discovered in the posterior part of the left thalamus, encroaching on the
third ventricle posteriorly. It reached to the pineal gland, and had
destroyed it, and had caused the chronic hydrocephalus found at the
operation. In substance it was, for the most part, soft and whitish,
and was described as a gliomatous neuro-epithelioma. Elschnig, when
describing this case, recalls another which he had seen a few years ago,
in which the symptoms were very similar. They had arisen from
the existence of a cyst (cysticercus) in the floor of the aqueduct of
Sylvius, which was diagnosed during life, and was also demonstrated
post-mortem.

The Physiology of the Intra-ocular Pressure.

It might seem a singular fact, but a fact it is, that at this day
opinions are sharply divided in regard to the causation and main-
tenance of the intra-ocular pressure, a subject which was recently the
subject of a " full-dress " debate at the Eye section of the Royal Academy
of Medicine.

The discussion was opened by Dr. Leonard Hill, whose expressed
opinions on the subject may be summed up thus :—The aqueous pres-
sure varies within fairly wide limits, depending upon the blood-pres-
sure : the higher the arterial pressure the higher is the aqueous pressure.
In animals he had taken readings of the height of the pressure, and
found that it varies (in the cat, etc.) between 16 mm. of mercury
and 62. This aqueous pressure has as one of its functions to keep
the eyeball distended, else it would cease to be so perfect an instru-
ment from an optical point of view as it is. The absolute pressure may
vary between wide limits without harm, for the coats of the eyeball
can resist high pressure, and the eyeball maintains the same form and
size no matter whether the arterial pressure be as high as 150 mm.,

(when an effort is being made) or so low as 100 (when the person is at rest); in the former case the aqueous pressure may be 50 mm. and in the latter 20. The aqueous is practically at the same pressure as the capillary venous pressure in the chorioidal fringes, by which it is secreted. The pressure of aqueous (and of vitreous—which is the same) is equal to the pressure in the veins at the place of exit from the eyeball. If it were greater the veins would be shut up, for the wall of a vein is incapable of supporting any pressure from without. One proof of this, to his mind, is afforded thus :—Open one of the vortex veins in the eye of a cat, allow the blood to escape, and, by raising the pressure bottle, force fluid into the aqueous chamber. When the aqueous pressure equals the arterial pressure the flow from the vein ceases. The two pressures must therefore rise and fall together. Another illustration is afforded by the behaviour of the eye of a cat, from which the aqueous had been drawn off. When the arterial pressure was then raised by compression of the belly of the cat numerous hæmorrhages burst from the iris because the vessels there were no longer supported by any aqueous pressure.

Professor Starling expressed his opinion that there was no real *a priori* ground for doubting that the intra-ocular fluid was a secretion just as much as saliva (for example) was a secretion, for the cells of the epithelium lining the ciliary processes are just as well formed as are those of the salivary glands. But there is a developmental difficulty in regard to this supposed secreting power of these cells, and it is therefore needful to consider what would be the condition of affairs if the fluid was merely excreted and not secreted by the aid of any ciliary glandular tissue. In the first place the intra-ocular pressure would rise and fall with the blood-pressure, which it does. He regarded Professor Hill's postulated maximum intra-ocular pressure of 60 or 62 mm. as much too high, nothing approaching to it could he himself obtain without extreme vascular pressure ; 25 mm. of mercury he should regard as the very maximum normal for the human eye.

The intra-ocular pressure can be shown to vary not merely with the general but with the local alterations of blood-pressure ; this can be shown by stimulation of the sympathetic. According to Hill the intra-ocular pressure and the intra-vascular in the capillaries and veins of the eye must be equal, but Starling demonstrated by means of a model that stasis must follow unless the latter were greater than the former. The statement that an excess of pressure in the capillaries over the veins must result in a rupture of capillaries because their walls are so fine is in error, Starling says, because these walls, though absolutely fine, are strong relatively to the dimensions of the tubules which they form, and because fluid would not, in that case, be driven into the veins at all. Starling is convinced that there must be a considerable difference of pressure between the blood in the capillaries and the intra-ocular

pressure, and between the blood in the capillaries and that in the veins.

As regards rate of absorption and secretion, he puts this down as approximately 12 c.mm. per minute. If the fluid is obtained merely by filtration, how is it that while it contains the same proportion of salts as the plasma, it is free from protein ? That fact and others seem to him to be a fair point for those who regard the mechanism as one of true secretion.

Mr. Priestley Smith, speaking from a clinical as well as a scientific point of view, agreed with Professor Starling that a pressure of 60 mm., as suggested by Professor Hill, was absolutely out of the question as representing the tension of the human eye : he also would regard 25 mm. as the upper limit of the normal pressure. Nor could he agree with those who regarded the wall of the eye as a rigid case,—a necessary condition for the truth of Professor Hill's scheme.

There is none of the more recent writers on glaucoma who has more definite views in regard to the intra-ocular tension and the maintenance of its level than Dr. Thomson Henderson, who expressed himself strongly in favour of Professor Hill's contention. He put his points in this way :—The intra-ocular pressure must be either greater, equal to, or less than the venous pressure at the point of exit. If the intra-ocular pressure of the aqueous were less than the venous pressure in Schlemm's canal, the aqueous could not get away : if the intra ocular pressure of the aqueous were greater than the venous pressure, the venous walls of Schlemm's canal would be compressed. They must therefore be equal, and balance one another.

The further discussion of the problem, in which numerous experts took part, was very illuminating, but does not adapt itself to reproduction in this place. W. G. S.

THERAPEUTICS.

UNDER THE CHARGE OF

JOHN EASON, M.D.

THE BENZOL TREATMENT OF LEUKÆMIA.

SELLINGS (*Ziegler's Beiträge*, 1911, Bd. li.) has shown experimentally that benzol injections produce in rabbits a marked diminution in the number of leucocytes in the blood, and a temporary atrophy of the blood-forming organs, especially the bone-marrow. Koranyi and Kiralyfi (*Wien. klin. Woch.*, No. 35, 1912 : *Berl. klin. Woch.*, No. 29, 1912) have since treated six cases of leukæmia with benzol. They concluded that benzol reduced the leucocytes to normal proportions, and produced a definite diminution in the size of the enlarged glands and spleen. They did not observe that these returned to a normal size, and the blood likewise remained distinctly pathological. Benzol appeared therefore to be

a temporary means similar to X-rays for improving certain of the characters of the disease. Following on these observations isolated cases have been published by several observers, all of whom arrived at a more or less favourable opinion of the drug in the treatment of leukæmia.

To these Klein now adds his observations in the treatment of twelve cases, and he has experience of the method in ten other cases which have been under observation for too limited a time to be included in the published results. Klein's opinion is scarcely so favourable as Kiralyfi's, and he attributes this partly to the fact that his cases were of a more severe type, the leucocyte count in most of his cases being over 400,000, while the count in Kiralyfi's was usually under 200,000. Another observation made by him was that two cases which appeared practically identical in character reacted quite differently towards benzol. In the majority of his cases Klein obtained good results, but chiefly in those in which benzol was given in combination with X-ray treatment. Of the cases treated solely on benzol, one—a case of subacute myeloblastic leukæmia—was quite uninfluenced, as is this type also, according to Klein's experience, by the X-ray method. Three cases of typical myelogenous leukæmia improved, the blood, glands, and spleen all participating in the betterment. In two other cases a definitely favourable change was observable, but not in the striking degree reported by Kiralyfi. In one the leucocytes were reduced by a half, the spleen being very little diminished in size. After a month of the treatment the leucocytes again increased in numbers. In a case treated by the subcutaneous method there was little effect of any kind observable. Another case was treated for 150 days. One month after treatment was begun the entire condition definitely improved. Finally, the liver and spleen were considerably reduced in size, with but a moderate improvement in regard to the blood.

Taken together the results obtained suggest that the blood-forming organs are in many cases quite distinctly affected, and in this respect Klein's opinion is in agreement with Koranyi and Kiralyfi. In none of the cases did the microscopic characters of the blood return, even approximately, to the normal, with the single exception of a case which was treated both subcutaneously and by the ordinary method.

Klein's opinion is that the exclusively internal administration of benzol favourably influences the phenomena of leukæmia, but is not a reliable means of treatment in all cases.

The same observer speaks much more favourably of benzol preceded by X-ray treatment. By this method a very decided subjective and objective improvement was obtained, and the leucocyte count was specially improved. Klein feels no hesitation in recommending benzol as a drug suited to strengthen and prolong the favourable action of X-rays. And a much more favourable result is obtained by the com-

bined method than from benzol or X-rays alone. This method is specially recommended when the leucocyte count is very high.

By the administration of benzol soon after exposure to X-rays one may shorten the period of active treatment. But while benzol is thus an important aid in the treatment of leukæmia, it cannot be regarded as radically curative. The microscopic blood-picture never becomes normal. The improvement consists in a reduction of the leucocytes and an absolute or relative diminution of the abnormal types of cells. There persist always one or two per cent. of myelocytes or myeloblasts, and the eosinophils and mast-cells often remain absolutely increased. In cases of lymphatic leukæmia it is likewise observed that the differential count never becomes normal under treatment with benzol.

No opinion can yet be formed as to duration of the results of the treatment. Klein insists that the subjective phenomena improve. Strength, appetite, and activity increase. Febrile attacks cease early in the treatment. The anæmia improves especially under the combined treatment, but seldom vanishes entirely. In this respect the method is not so satisfactory as the X-ray method. It appears that the larger doses cause deleterious effects on erythropoiesis.

S. Stern (*Wien. klin. Woch.*, No. 10, 1913) reports an early case treated by benzol. Three grammes were given daily, increasing to six grammes. The treatment caused heartburn and acid eructations, but was otherwise well borne. With 58 days' treatment the red corpuscles increased from 3,680,000 to 5,570,000, while the white corpuscles were reduced from 264,000 to 15,200. The differential count changed in the following manner:—*Before treatment*—polymorphs, 48·5; myelocytes, 44·5; transitionals, 4; lymphocytes, 1; mononuclears, 1·5; eosinophils, 0·5 per cent. *After treatment*—polymorphs, 74; myelocytes, 2; transitionals, 4; lymphocytes, 4; mononuclears, 8; eosinophils, 4.

Before treatment was begun the spleen reached almost to the middle line, two finger-breadths below the umbilicus, while after treatment the organ was of normal size, the general condition greatly improved, strength was gained, and the weight increased by two kilograms,

As is usual when a powerful drug is first introduced, there have been untoward results. Neumann (*Therap. der Gegenwart*, February 1913) reports a case treated for 36 days by Koranyi's method with benefit, soon afterwards followed, however, by a relapse characterised by fever, diarrhœa, epistaxis, and thirty-nine days after treatment ceased, by death.

Klemperer and Hirschfeld (*Ibid.*) regard benzol as a very dangerous drug which may cause necroses in various organs. Frank Billings (*Therap. Gaz.*, vol. lx. No. 7) reports his experiences in treating five cases with benzol. Briefly, his conclusion is that the drug is a powerful agent—a two-edged sword—which is apparently a remedy of great

promise in leukæmia, but which, used carelessly, may defeat the purpose of its use and produce an equally serious condition, namely, grave aplastic anæmia, hypoplastic bone-marrow, and a fatal termination. Billings used a form of benzol which might have contained impurities, and Selling states that impure benzol contains nitro-benzol and other products (aniiin, etc.) : the anilin is probably the toxic substance which produces purpura hæmorrhagica, aplastic anæmia, etc. It would therefore appear very necessary to use a pure benzol, to be very cautious in regard to dosage, and to examine the blood frequently in order to avoid a possible aplastic anæmia.

I. Sohn (*Wien. klin. Woch.*, No. 15, S. 573, 1913) has investigated the action of benzol on the metabolism. His investigations throw further light on the question of its applicability to the treatment of leukæmias. To Sohn it appears that overhasty and probably too favourable conclusions have already been drawn. Sohn made very full metabolic observations in three non-leukæmic patients who were in relatively good health, and in a case of myeloid leukæmia.

One observation showed that 3 grammes daily of benzol continued for three days caused a marked increase of the neutral sulphur excretion. On the third day albumin appeared in the urine. In a second experiment 4 grammes daily caused loss of appetite, nausea, eructations, bad taste in the mouth, and vomiting. There was again an increase of the neutral sulphur in the urine, a reduction of the urea nitrogen, and a smaller increase of the ammonia nitrogen.

In another patient 5 grammes daily were given and produced similar symptoms associated with heartburn, and also similar effects on metabolism. In the case of myeloid leukæmia there was a white corpuscle count of 54·800 per c.mm., and the percentage count of the different varieties was—polymorphs, 19·25 : lymphocytes, 66·75 : neutrophil myelocytes, 10·5 : eosinophil myelocytes, 0·5 : basophil myelocytes, 1 : myeloblasts, 2 per cent. The patient was given 4 to 5 grammes of benzol daily for 4 days. On the third day the patient complained of nausea, headache, vomiting. The liver enlarged until it was 1½ finger-breadth under the costal margin. There was no icterus. On the 4th day there was diarrhœa, abdominal pain, nausea, general weakness, and slight œdema of the legs. The patient wished to rise from bed, but felt giddy and swooned. In a few minutes this was recovered from, but there was continued headache and nausea. Benzol was not again administered, and when the blood was examined two days later the lucocytes numbered only 5600 per c.m. : polymorphs, 45·25 : lymphocytes, 43·5 : myelocytes, 11·25 per cent.

As in the non-leukæmic cases there was a marked increase of the neutral sulphur of the urine and diminution of the urea nitrogen. On the fourth day albumin appeared in the urine, as in the first observation. Sohn points out that Wachtel has likewise observed the

causation of albuminuria by benzol administration, and that Pappenheim caused glomerulitis and marked parenchymatous changes in the kidneys of rabbits to which large doses of benzol had been administered. Pappenheim in his experiments also observed a slight degree of necrotic change beginning at the periphery of the hepatic lobules and spreading towards the centre. The same authority made the very significant observation that while the administration of benzol reduced the number of white corpuscles circulating in the peripheral blood, numerous polynuclear leucocytes collected simultaneously in the dilated capillaries of the lung, spleen, kidneys, and in the liver. Therefore his conclusion was that the peripheral leucopenia was not produced by a destruction of white corpuscles such as thorium or Röntgen rays produce, but by a pseudoleucocytosis in the liver.

Sohn then points out that his own experiments suggest a similar conclusion, as the excretions of uric acid before and during the administration of benzol are similar although the white corpuscles in the peripheral blood of the case of leukæmia were reduced from 54·800 to 5·600. Sohn ascribes the change in metabolism to such disturbances of the liver and kidney as are indicated by the albuminuria and by the glomerulitis and parenchymatous changes in the kidney, and necrotic changes in the liver observed by Pappenheim experimentally in rabbits.

Pappenheim has also pointed out that benzol may injure the mucous membrane of the intestinal tract, and this fact has to be considered side by side with the symptoms caused by administration of benzol, viz. nausea, heartburn, eructations, and loss of appetite.

Further evidence of the risk associated with the administration of benzol appears from the fact that an increase of neutral sulphur in the urine is also met with in grave conditions such as carcinoma, hepatic cirrhosis, acute phosphorus poisoning, deep chloroform narcosis, deprivation of food, and in other diseases with serious disturbances of the metabolism.

The object of treatment in leukæmia should not merely be the reduction of the number of leucocytes, but the improvement of the general state and the condition of the blood-forming organs. But, hitherto, almost the sole action attributed to benzol is a reduction of the white corpuscles. Even this is not always effected, as Sohn shows in another of his cases. Moreover, Sohn states the reduction is merely apparent, and is explained by a simultaneous increase of leucocytes in the internal organs. Sohn goes so far as to say there is no actual reduction and there is no genuine improvement in the state of the patient.

In consideration of the harmful effect on the digestive tract, the histological changes produced on the liver and kidney and the significant reduction in the oxydation processes tending to cause

acidosis, Sohn warns against the administration of benzol, especially in large doses, for the treatment of leukæmia.

Mode of Administration.—Koranyi gave benzol in gelatine capsules, each containing 0·5 gramme of benzol and 0·5 gramme of olive oil. Ten capsules were taken daily. As this method frequently caused eructations and nausea in Klein's cases, he now gives 15 drops of benzol in olive oil dropped into milk, ten times daily. This approximately equals 5 grammes daily. This method was well borne in most cases, but many cases bear the treatment so badly that it must be discontinued. Tuberculosis and bronchitis are contra-indications. In recent cases the *combined* treatment with 3 to 4 grammes should be tried, as 5 grammes are apt to influence erythropoiesis harmfully. For subcutaneous use the maximum daily dose is 1·5 gramme, with olive oil. J. E.

NEW BOOKS.

The Principles and Practice of Obstetrics. By Joseph B. de Lee, A.M., M.D., Professor of Obstetrics at the North-Western University Medical School, Chicago. Pp. 1060, with 913 Illustrations, 150 in Colours. Philadelphia and London: W. B. Saunders Co. 1913. Price 35s. net.

To the long list of manuals on Midwifery written by American authors there seems to be no end. And each large work of this kind is, if possible, more lavishly and elaborately illustrated than its predecessor. It cannot be said that Dr. de Lee, like some authors, has fallen into the error of over-illustrating his book, for there is no doubt that good illustrations are eminently serviceable to the student, and in such a subject as obstetrics impress on his mind the really important principles of diagnosis and treatment much more vividly than pages of text would do. In this respect we congratulate Dr. de Lee. The illustrations, carried out by leading American artists, are exceedingly well done, and are in most instances of a thoroughly practical character.

It is, of course, impossible in a short review to criticise, even very briefly, the various parts of this colossal work, so we may be allowed to refer to a few points relating to the important matter of treatment in some of the obstetric emergencies and difficulties.

In the treatment of eclampsia it seems clear that the author agrees with Dührssen's *dictum*—"after the first convulsion put the patient into a deep sleep, and deliver at once." He says that experience is accumulating to prove that the rapid emptying of the uterus in deep narcosis gives the best results. Now a large number of very eminent authorities would absolutely deny that it is the best treatment to be in any special hurry to empty the uterus in these cases. Forcible delivery certainly saves more children, but does not, in our opinion, give appreciably better results so far as the recovery of the mother is

concerned : and Cæsarean section, by far the most rapid method of delivery known, does not lead to a cessation of the fits in any greater proportion of cases than after natural delivery. When Dr. de Lee comes to consider the medical treatment of eclampsia his account of it is most disappointing, and the practitioner who wishes to treat a case on these lines will find no definite rules laid down for his guidance. The author has no belief whatever in morphia for this disease. He says it increases the coma, and kills many of the children. Now we believe, with many others, that no single drug is so valuable in eclampsia if enough of it is given. Professor G. Veit, who was mainly responsible for introducing this treatment, had a series of 60 patients with only two deaths. Has any other treatment ever yielded such excellent results ? The experience of the Rotunda Hospital, Dublin, fully confirms the value of morphia in eclamptic cases. Dr. de Lee, like many other obstetric surgeons, will not look at eclampsia in its physiological aspect, and he therefore fails to appreciate the significance of certain striking clinical features in this condition which point very clearly to the adoption of definite principles of medical treatment. Of course the fits, if numerous, must be controlled, and morphia is more and more supplanting chloroform for this purpose. But after that comes the really vital question—how shall one establish the renal secretion ? In practically every case of eclampsia the secretion of urine is, at some stage of the disease, suppressed or nearly suppressed. Morphia, venesection, saline infusions, washing out the stomach with very hot water, and saline cathartics all exert a powerful influence in starting off the secretion of urine when it is suppressed, as it is in eclampsia and uræmia, from intense vasomotor spasm.

In the treatment of a moderately severe case of accidental hæmorrhage, and when the cervix is slightly opened up, we are glad to see that the author advises that the membranes be ruptured before packing the vagina and applying counter-compression by means of a firm abdominal binder. He points out what most authorities now recognise, that the rupture of the membranes, by securing uterine retraction, is soon followed by stronger and more efficient pains, and he inculcates the main principle of treatment in these cases, which is to compress the bleeding uterus firmly between a cervico-vaginal tampon and an abdominal binder until delivery can be safely accomplished. We notice that he introduces a colpeurynter instead of gauze through the cervix before inserting the vaginal packing, and, in our experience, gauze or cotton-wool for both cervix and vagina is a better method.

In difficult occipito-posterior positions, with the occiput persistently backwards, we note that the author very properly believes in correcting the position manually. This is undoubtedly the scientific treatment for these troublesome cases ; it is hardly ever good practice to deliver a child with the occiput behind. Dr. de Lee speaks highly of a method which we have frequently used with signal success under

specially difficult circumstances. The procedure consists in passing the hand over the child's face and getting the tips of the fingers on to its posterior shoulder. Then the child's body is swung round to the front, past the promontory of the sacrum, while the fœtal head, fitting into the palm of the hand, naturally goes with the trunk. In the usual method of manual rotation it is easy to turn the occiput to the front, but the body of the child is not always easily turned simultaneously through the mother's abdominal wall. It is a better method to rotate the child's body by means of the intra-uterine hand.

The section dealing with the use of the forceps is very full and well illustrated, but the author is not at all enthusiastic about the axis-traction instrument. By means of the Osiander manœuvre he says he is better able to give the fœtal head a direction which a knowledge of the mechanism of labour indicates. But the newly-fledged doctor does not always know very much about the mechanism of labour, and then a good axis-traction forceps is remarkably useful. We think the admirable scientific demonstrations of the physics of the axis-traction instrument given by the late Dr. Milne Murray have placed his forceps in an unassailable position.

As regards the question of early rising in the puerperium, the author is quite unconvinced by the arguments of those who advocate this principle of treatment. Like the vast majority of physicians, he does not condemn his patients to such absolute rest in bed as formerly; nevertheless he states that the perfect condition of the patient and her frequent requests to be let out of bed should not lead the doctor to permit it until the ninth or tenth day. In cases of early rising he holds that fever is more common, while severe prolapses and cystoceles occur in a larger proportion of cases.

Taking this text-book as a whole we must congratulate the author on the scientific spirit in which it is written, and we can confidently recommend it alike to the student and practitioner. A special word of commendation is also due to the publishers for the attractive way in which the work has been produced.

Surgery of the Brain and Spinal Cord, Based on Personal Experiences. By Professor FEDOR KRAUSE, Berlin. English Adaptation by Dr. MAX THOREK, Chicago. Vols. II., III. Illustrated. London: H. K. Lewis. 1912 Price 30s. net per volume.

IN the volumes now before us we have the completion of the English translation of Professor Fedor Krause's work on the *Surgery of the Brain and Spinal Cord.* The first volume, which we noticed a little over two years ago, was devoted to a description of the technique of intracranial surgery, and reflected the practice of the author in great detail. The impression left after a careful perusal of it was that we were in touch with a master in his subject, and this impression is

deepened when we study the succeeding parts of his work. It is impossible within the space at our disposal to do more than indicate the lines on which Professor Krause presents his material. The surgery of the brain is discussed under the main headings of "Epilepsy," "Neoplasmata," "Intracranial Suppurations," and "Injuries." The subject of epilepsy receives most exhaustive treatment, over 100 pages being devoted to its consideration. The physiology of the brain in its bearings on Jacksonian and general genuine epilepsy is fully described, and in addition to the description of laboratory experiments numerous clinical observations are given in support of the author's conclusions. Some of the results obtained by cortical excisions are most striking, and in Jacksonian epilepsy the ultimate results are most encouraging. The author adopted operative measures in general epilepsy only after much hesitation, and expected little from it. He is therefore not disappointed that the results have not proved satisfactory.

The section on Intracranial Tumours begins with an analysis of the symptoms and their bearing on localisation and the question of operability. Thereafter each form and site of neoplasm is considered, and abundantly illustrated from personal clinical records.

The section on the Surgery of the Spinal Cord, which runs to 230 pages, is the most complete and satisfactory consideration of the subject with which we are acquainted, and it amply repays the most careful study.

The work throughout is illustrated by a series of coloured illustrations, made at the operating table, which are as nearly perfect as book illustrations can be made. Dr. Max Thorek of Chicago has placed English readers under a deep debt of gratitude by the able way in which he has accomplished his task of adapting this great work to their requirements. A complete index to the three volumes renders the work easy of reference.

Modern Wound Treatment and the Conduct of an Operation. By Sir George T. Beatson, K.C.B. Pp. 106. Edinburgh : E. & S. Livingstone. 1913. Price 2s. net.

In this useful little volume Sir George Beatson pays his tribute "of gratitude and reverence to the memory of Lord Lister," and tells in plain language the story of the introduction and development of the antiseptic method of wound treatment. The author is eminently qualified for his task, as he served as a dresser in Lister's wards in 1871, and has followed in practice all the changes in technique which have since taken place. We endorse his protest against the prevailing tendency "to elevate this so-called 'aseptic surgery' into the rank of a new system of wound treatment when it is nothing of the kind." There is no such thing as aseptic technique practised to-day. The

methods employed are essentially antiseptic; it is the results that are aseptic, and this was Lister's original ideal.

After giving a short outline of Lister's life the author discusses the principles of wound treatment, and then goes on to describe the present-day methods of applying these principles. This is a most useful and instructive work to place in the hands of those who are commencing their surgical studies in hospital.

NEW EDITIONS.

Human Embryology and Morphology. By ARTHUR KEITH, M.D., LL.D., F.R.C.S. Third Edition. Pp. 475. With 142 Illustrations. London : Edward Arnold. 1913. Price 15s. net.

IN preparing a new edition of this work Mr. Keith has taken the opportunity to recast its whole form. "In place of beginning with a well-known part of the body, such as the face, the history begins with the formation of the embryo from the fertilised egg, and is continued in subsequent chapters by an attempt to give a consecutive picture of the origin of the human body, and of the several systems which make the body a physiological whole." The result is that we have before us what is practically a new work on embryology, and we can confidently recommend it to our readers as one which not only gives a most complete and intelligible description of the development of the human frame, but in addition throws many interesting and valuable sidelights on questions of surgical pathology which can be interpreted in terms of embryology. The text is copiously illustrated by simple yet instructive diagrams.

Diseases of the Stomach, Intestines, and Pancreas. By ROBERT COLEMAN KEMP, M.D., New York. Second Edition. Pp. 1021. With 388 Illustrations. Philadelphia and London : W. B. Saunders Co. 1912. Price 28s.

THE comparatively short time which has elapsed since we had occasion to notice the former edition of this work shows that it has met with acceptance at the hands of practitioners, to whom it is addressed. We can only repeat our appreciation of Dr. Kemp's work, which has been thoroughly revised and amplified in the light of recent work.

Clinical Medicine : A Manual for the Use of Students and Junior Practitioners. By JUDSON S. BURY, M.D., F.R.C.P., B.Sc. Third Edition. Edited by JUDSON S. BURY and ALBERT RAMSBOTTOM, M.D., M.R.C.P. London : Charles Griffin & Co., Ltd. 1912. Price 17s. 6d.

THIS book fulfils a useful purpose by being a link between the very large and small books on *Clinical Medicine.* The present edition has

been thoroughly revised, the general plan of the book remaining the same as before. The book possesses many illustrations. Several good X-ray photos have been included, but many of the old illustrations should have been replaced by more modern ones. In the chapters dealing with the heart a more detailed description of how to set up and work the polygraph would have been useful. The surface marking of the valves of the heart requires more detailed description. No mention is made in the section dealing with the blood of the glycogen reaction, and the method of calculating the hæmoglobin index is not mentioned. Under the heading of urine examination it should have been made clear that it is by observing the colour of the froth only a positive or negative diazo reaction is determined. The authors state that a positive is when "the mixture" turns scarlet. The description of the nervous system commences with a short, useful anatomical and physiological résumé. The authors take up the clinical examination of this system by beginning with the investigation of muscular action, then proceed to sensations, reflex action, language, and finally the special senses are considered.

This new edition will doubtless continue to be as useful a clinical guide as its predecessor.

Students' Manual of Medical Jurisprudence and Public Health. By G. H. GIFFEN, F.R.C.S.I., and JAMES DUNDAS, M.D., D.P.H. Third Edition. Pp. 330. Edinburgh: William Bryce. 1913. Price 5s.

THE usual history of subsequent editions is that they increase in size with each succeeding issue. This is not so, however, in this case. The second edition of 1906 contained 364 pages, while this contains but 330. The chief condensation has been effected in the important subject of public health, and here the author, Dr. James Dundas, has been able to compress all that seems necessary to him within the space of 95 pages. The major part of the volume thus deals with medical jurisprudence and toxicology, and forms a very fair summary of their principal facts. The various subjects seem, however, to be very unequally dealt with, and in many cases seem to have no relation with the preceding or succeeding subjects. We hardly think that the classification of the poisons adopted by the authors is helpful to the student. The section on public health is least satisfactory, however, because of the extreme degree of condensation which has been adopted, and it would be well in a subsequent edition to extend and amplify this section. We desire to draw attention to a statement which the authors make, in order to contradict it. They say that "diphtheria may be spread by animals, especially cats." All the best veterinary authorities, we believe, deny that there is any such transmission to the human being. The manual will be helpful to students preparing for examinations, provided that they amplify it from their lecture notes.

Innere Sekretion: Ihre physiologischen Grundlagen und ihre Bedeutung für die Pathologie. By Professor Dr. ARTUR BIEDL. Second Edition. Part I. Pp. 534. Berlin and Vienna: Urban & Schwarzenberg. 1913. Price Mk.24.

LESS than three years ago the first edition of this work appeared, and it has been translated into English and Russian. The present edition is more than twice as large as the previous one, and consequently has necessitated division into two volumes. This increase in size is due to the enormous amount of work which has been done recently on the subject. The inclusion of the results of this work has rendered it necessary to alter largely the text, and so far as Part I. goes a very thorough survey is given of modern knowledge of the thyroid, parathyroid, thymus, and suprarenals.

NOTES ON BOOKS.

IN their *Manual of Infectious Diseases Occurring in Schools* (John Wright & Sons, Ltd., Bristol, 1912, price 3s. net) Drs. Armstrong and Fortescue-Brickdale cater primarily for schoolmasters, but none the less the book will be found useful by those in medical charge of children in schools and institutions generally. The text is trustworthy, and the hints on preventing the spread of infection are sensible and of practical application.

The Ship Captain's Medical Guide, edited by Charles Burland, M.D. (fifteenth edition, pp. 214, published by His Majesty's Stationery Office, 1912, price 2s.). The purpose of this volume, "issued by the Board of Trade for official use," is to act as a guide for the ship's officer in cases of accident or illness on board, and while in most cases the instructions are clearly enough given, greater explicitness would be helpful. Thus, while "soiled hands of the attendant" are mentioned as a source of contagion (*e.g.*, in typhoid), no warning is uttered against that common practice at sea of constituting the *steward* as sick attendant, a danger for all illnesses which might well have been emphasised in the chapter on the prevention of disease. In the instructions, again, for catheterisation the only reference to asepsis is, "Dip it in carbolic oil"; and surely it is a risky experiment, in some cases, to "let down a lighted candle if the air in a hold be suspected of being foul."

Professor Sidney Reynold's book on *The Vertebrate Skeleton* (second edition, Cambridge University Press, 1913, price 15s.) commences with an excellent introductory account of the terms used in the description of the vertebrate skeleton, which is followed by a classification of the various groups of the vertebrata. The remaining and greater part of the book is devoted to records of the more important features of the various skeletal parts in the different groups, or in

particular individuals of the groups. The descriptions are short, clear, and well illustrated. The book is well got up, and, although it can scarcely be called attractive, it will certainly prove useful to those who are interested in the general features and the more important details of the vertebrate skeleton.

Hoblyn's Dictionary of Medical Terms, by J. A. P. Price, M.D. (fifteenth edition, G. Bell & Sons, price 10s. 6d.), is probably of more value to the lay than to the medical reader. It has been added to chiefly on the subjects of bacteriology and radio-activity, and on these subjects as well as on general matters it is very sound. Inequalities always occur, but one is surprised to find iodoglidine mentioned and not salvarsan. Much of the terminology of skin diseases given is now not used. The volume is well printed and of a handy size.

BOOKS RECEIVED.

COLE, S. W. Practical Physiological Chemistry. Third Edition . . (*Heffer & Sons*) 7s. 6d.

DAVIS, H. Skin Diseases in General Practice . . . (*Froude, Hodder & Stoughton*) 15s.

FERNIE, W. T. Our Outsides, and What They Betoken . . . (*Wright & Sons*) 4s. 6d.

FOX, H. Elementary Bacteriology and Protozoölogy . . . . (*J. & A. Churchill*) 6s. 6d.

FRENCH, M. Babies : A Book for Maternity Nurses . . . . (*Macmillan & Co.*) 1s.

GABBETT, P. C. Manual for Women's Voluntary Aid Detachments. Second Edition
(*Wright & Sons*) 1s.

GARRE, C., and H. QUINCKE. Surgery of the Lung. Second Edition
(*Bale, Sons, and Danielsson*) 12s. 6d.

HEAPE, W. Sex Antagonism . . . . (*Constable & Co.*) 7s. 6d.

HEWER, J. L. Our Baby. Fourteenth Edition . . . . . (*Wright & Sons*) 1s. 6d.

HORN, A. E., and F. F. G. MAYER. Report on Certain Outbreaks of Yellow Fever in
West Africa in 1910 and 1911 . . . . —

HORNSBY, J. A., and R. E. SCHMIDT. The Modern Hospital . . (*W. B. Saunders Co.*) 30s.

JOHNSTONE, R. W. A Text-Book of Midwifery . . . . . (*A. & C. Black*) 10s. 6d.

LAMB, W. Diseases of the Throat, Nose, and Ear. Third Edition
(*Baillière, Tindall & Cox*) 7s. 6d.

LINDSAY, J. Gout . . . . (*Froude, Hodder & Stoughton*) 5s.

LUCIEN, M., and J. PARISOT. Glandes Surrénales et Organes Chromaffines (*Gittler, Paris*) —

MACDONALD, SARAH. Maternity Nursing . . . . . . (*Methuen & Co.*) 3s. 6d.

MEDICAL and Surgical Report of the Presbyterian Hospital, New York. Vol. IX., 1912
(*New York*) —

MURPHY, J. KEOGH. The Practitioner's Encyclopædia of Medicine and Surgery. Second
Edition . . . . (*Froude, Hodder & Stoughton*) 35s.

PANTON, P. N. Clinical Pathology . . . . (*J. & A. Churchill*) 12s. 6d.

POLLOCK, C. E., and L. W. HARRISON. A Manual of Venereal Diseases. Second Edition
(*Froude, Hodder & Stoughton*) 10s. 6d.

STIMSON, L. A. A Treatise on Fractures and Dislocations. Seventh Edition
(*J. & A. Churchill*) 24s.

SYM, W. G. Diseases and Injuries of the Eye . . . . . . (*A. & C. Black*) 7s. 6d.

THE Surgical Clinics of John B. Murphy, M.D. 1913. Vol. II., No. 2 (*W. B. Saunders Co.*) —

THORNE, L. T. The " Nauheim " Treatment of the Heart and Circulation. Fourth Edition
(*Baillière, Tindall & Cox*) 3s. 6d.

THRESH, J. C. The Examination of Water and Water Supplies. Second Edition
(*J. & A. Churchill*) 18s.

TRANSACTIONS of the American Pediatric Society. 1912. Vol. XXIV. . . . . . —

TRANSACTIONS of the College of Physicians of Philadelphia. Third Series. Vol. XXXIV.,
1912 . . . . —

WARWICK, F. J., and A. C. TUNSTALL. " First Aid " to the Injured and Sick. Eighth Edition
(*Wright & Sons*) 1s.

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